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Revenue Earning Locomotives

THE value of a locomotive is measured by its ability to earn revenue. This ability is in turn dependent upon the fitness of the locomotive for the work to be done, and the cost of its operation and maintenance.

There is no question as to the increased value of strictly modern locomotives as compared to those built ten or more years ago.

The replacement of obsolete power with up-to-date units specially designed to meet today's exacting demands in both freight and passenger service, has invariably proved profitable.

THE BALDWIN LOCOMOTIVE WORKS ★ 1831 1931

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

RAILWAY AGE

Advancing the Railway Executives' Program

On November 19 last the brotherhoods of railway train service employees adopted resolutions opposing government policies resulting in unregulated and subsidized competition of water and highway carriers with the railways, and other railway labor organizations previously or subsequently adopted similar resolutions. On November 20 the Association of Railway Executives adopted a "Declaration of Policy Deemed Necessary to the Continuance of Adequate Transportation Service to the Public". The action taken by the railway employees' and executives' organizations started a remarkable discussion of transportation conditions and problems. As numerous seemingly conflicting interests are involved, it is not surprising that much of the discussion has been controversial and that there have been misunderstanding and even misrepresentation.

The misunderstanding and misrepresentation have related principally to the railway executives' program; and it has been asserted that some executives are not in sympathy with, or are even opposed to, parts of the program. It is necessary carefully to compare the program with the views expressed by some executives to determine whether there really is conflict between them. With reference to competing means of transportation, the program is as follows:

"A withdrawal of governmental competition both through direct operation of transportation facilities, as well as indirectly through subsidies.

"A fairly comparable system of regulation for competing transportation service by water and on the highways."

Attitude of Railway Executives

No railway executive, as far as we know, has said anything indicating that he is out of sympathy with the declaration against government competition and subsidies. Extracts from an address made by Ralph Budd, president of the Great Northern, have been disseminated by the motor bus and truck interests for the purpose of giving the impression that he is opposed to the executives' program. In his address at Des Moines on January 7 Mr. Budd said: "It would seem so fair as to be a safe assumption that the public will recognize the propriety of asking that water transportation shall be financed with private capital so long as the railways, with which the water transportation competes, are supported by private capital, and that the cost of improving waterways be included in calculating the cost of water transportation." In regard to taxation of motor vehicles, he said, "Taxes of highway users already are very high in some states", and he cited the taxes being paid in Minnesota, but he said nothing to indicate that in his opinion any class of highway carrier should be subsidized by being charged less for the use of the highways than the equivalent of the damages and costs that it causes. He did not oppose, but advocated, interstate regulation of highway traffic, saying that in the absence of such regulation "there is much unnecessary duplication which is injurious alike to the highway carriers in competition with each other and to the railways with which the highway carriers compete".

The testimony presented by John F. Deasy, vice-president of the Pennsylvania Railroad, before the Interstate Commerce Commisison in its investigation of the relations between rail and highway transport service, has been construed as indicating that the management of the Pennsylvania is not in sympathy with the executives' program. In an address in Philadelphia on April 21, General Atterbury, president of the Pennsylvania, said: "For the proper realization of these advantages (of co-ordination of different means of transportation) it is essential that the railroads be relieved from the discrimination which they now suffer from unregulated and subsidized competition, and freed of the legal restrictions which bar them from engaging in shipping between domestic seaboards and on the inland waterways."

This is an emphatic declaration in favor of the adoption of the executives' program as essential to the sound co-ordination of all means of transportation, of

which the Pennsylvania's management is the most outstanding exemplar and advocate.

The reason why the views expressed by some railway executives have been construed as inconsistent with the executives' program is that the program itself has been misrepresented as intended to destroy competing agencies and give the railways a monopoly of inland transportation. Only, however, upon the assumption that competing means of transportation cannot survive if deprived of subsidies and subjected to a "fairly comparable system of regulation" can the program be construed as intended to destroy them, and there is no economic justification for the existence of any transportation agency that cannot survive under reasonable regulation and without subsidies. Every railway executive believes that there is economic justification for much highway transportation and that it will survive under reasonable regulation and without subsidies; but that in the public interest equal treatment of all means of transportation by the national and state governments should be adopted in order that each means shall be confined to that sphere in which it can serve the best and most economically.

Railway Labor Union Policy

Railway labor leaders and employees have vigorously attacked the unfair competition to which the railways are being subjected, and by which many railroad men are being deprived of their employment; but in some states the legislative agents of labor unions have tried to secure the passage of provisions prohibiting railways from engaging in the operation of buses and trucks. Of course, the railways are opposed to such provisions, and intelligent labor leaders should see that they would be of no advantage to railway employees. To whatever extent highway transport is to continue, it will be conducted either by the railway companies, or by other companies, or by both. If it is conducted only by other companies the railways will be prevented from securing such benefits as they might derive from conducting it, which could hardly be advantageous to railway employees; and there will certainly be less chance of railway men securing employment in operating buses and trucks from other companies than from the railways.

The railways' "Declaration of Policy" was made public at an opportune time. No railway executive anticipated last November that railway earnings would be so bad as they have been thus far in 1931. The increasing seriousness of the railway situation has made the public unusually receptive to arguments and appeals in behalf of more fair and constructive government transportation policies. Those industrial traffic managers who have undertaken in the supposed interest of shippers to oppose the railroads' program appear to have been acting contrary to the preponderant opinion of the nation's financial and business leaders, as well as of the public. The press usually reflects public sentiment; and a majority of the country's newspapers, both large and small, are attacking the present misuse of the highways and urging the necessity of the adoption of constructive government policies to restore railroad earning capacity. In some states legislation increasing the license fees of buses and trucks and regulating their length, width and weight has been enacted, and similar legislation in other states is expected.

Large government expenditures upon rivers and canals, and their use by carriers without charge, are more indefensible economically than the present use of the highways by motor vehicle carriers for hire; for operators of buses and trucks do always pay in the form of license fees and gasoline taxes for the use of the highways, although usually not enough. Nevertheless, while much support for the part of the railway executives' program relating to subsidization and regulation of highway carriers has been secured, not much support apparently has been secured for the part of it relating to inland water carriers. Undoubtedly an increasing number of persons understand the economic unsoundness of subsidizing transportation by inland waterways, but this policy has such strong political and business backing that it is difficult to make any headway against it.

Favorable Public Sentiment Created

In addition to advocating "a fairly comparable system of regulation" for competing means of transportation and a withdrawal of subsidies, the executives' program urged a respite from reductions of rates. The Interstate Commerce Commission has ordered a large reduction of western grain rates to be made on June 1, but the general discussion of the entire transportation situation, and the very poor earnings reported by the railways, have been a protection from demands for rate reductions. During the depression of 1921 there were vigorous demands for reductions of rates, although railway net earnings were worse than in 1930, and about as bad as they have been thus far in 1931. Reductions of both rates and wages were made in 1922, and it is very plain that unless reductions of wages accompanied any general reductions of rates made during the present depression there would be many railroad bankruptcies.

The announcement of the executives' program last November and the subsequent discussion of it unquestionably have created sentiment for fairer treatment of the railways. They have helped to call public attention not only to the poor earnings of the railroads, but to the fact that they are suffering from adverse influences to which other industries are not subject. It seems probable that as a result economically unsound competition will be reduced, co-ordination of the various means of transportation will be promoted, railway earning capacity will be restored more rapidly than it otherwise would be, and deterioration of railway service will be limited. The fight for fair treatment of the railways has not been won; but progress has been made, and there is a good prospect that it will be won.

Handling Cars at Ports

It is a noticeable fact that miles per car per day of most roads serving the highly industrialized Atlantic seaboard are relatively low in comparison with those of Western railroads. Such comparison does not, however, reflect upon the operating efficiency of the Eastern lines, since the short hauls and the heavy switching, even at best, tend to reduce this average materially. In fact, no comparison of miles per car per day, as between one road and another even in the same territory, is entirely fair, as no two roads have identically the same operations.

The car movement in shipside yards presents a considerable problem. The necessity of meeting the sailing time of ships, the tendency of shippers, particularly of coal, to keep a number of cars at the dock yards unbilled, and, in some ports, the necessity of serving a number of widely scattered docks, all have their effect in lowering the average. Yet improved operations in such yards are not without their effect. The trend of car mileage on the roads in question has been steadily upward and undoubtedly this would have continued if the depression and its attendant idle cars had not played havoc with the averages. Even so, as a general rule, the miles per car per day on roads serving these seaports are higher than they were, say five years ago, thus portraying a progressively improving operation, when comparisons of averages of the same road are made over this five-year period.

Various means have been employed at different ports to secure the more prompt release of cars and quicker return movement, but the improvement can be traced principally to the increased supervision and to the education of employees in the importance of prompt car movement. Instead of giving up the seaports as hopeless from a car-movement standpoint, the railways have attacked the knotty problem, and even under abnormal business conditions the results of their efforts are making themselves felt. Roads serving seaports and thickly industrialized centers probably will never run their average miles per car per day up over a hundred, as some of the bridge routes have been successful in doing, but, within their limitations, it is still possible to improve their average.

Railways in 1921 and 1931

The revolutionary changes that have occurred in the railroad industry during the last ten years are strikingly illustrated by comparative statistics for the first two months in 1921 and 1931, both years of severe depression.

Total earnings in the first two months of 1921 were $876,000,000 and in the first two months of 1931 were $702,500,000, a decline of 20 per cent. Freight business increased 5 per cent, but freight rates were so reduced that freight earnings declined from $609,000,000 to $534,500,000, or about 12 per cent. Passenger earnings declined from $194,000,000 to $100,000,000, or 48½ per cent.

Operating expenses in 1921 were $829,000,000 and in 1931, $566,000,000, a decline of 32 per cent. Total expenditures for maintenance in 1921 were $348,000,000 and in 1931 $234,000,000, a reduction of 33 per cent. In January, 1921, the number of employees was 1,805,000 and in January, 1931, only 1,334,000, a reduction of 471,000 or 26 per cent.

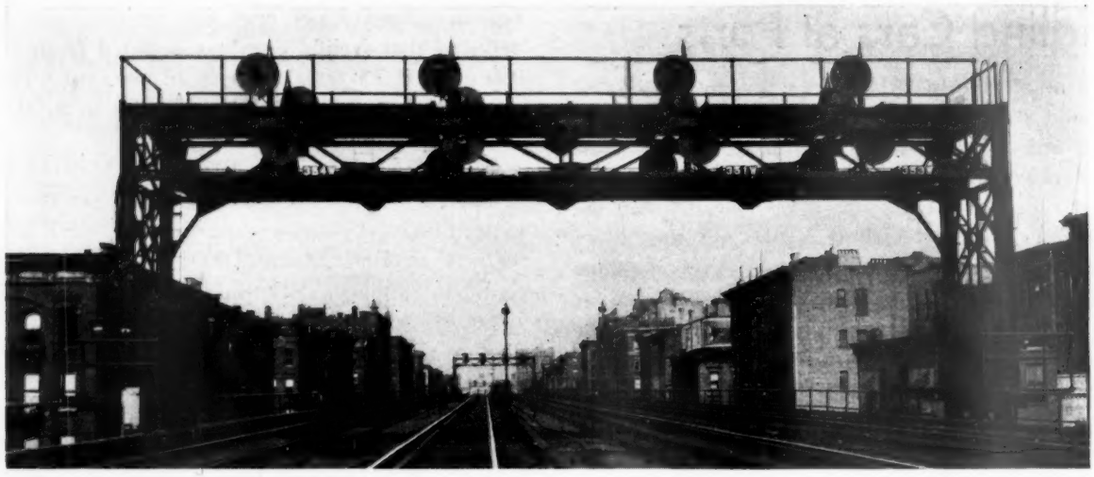
Taxes in 1921 were $44,800,000 and in 1931, $54,250,000, an increase of 21 per cent. This increase in taxes presents a remarkable contrast with the reductions of 20 per cent in total earnings and 32 per cent in operating expenses.

In the first two months of 1921 the railways as a whole incurred an operating deficit of $8,215,000—in other words, their operating expenses and taxes exceeded their total earnings by about this amount. In 1931 they earned $61,000,000 net operating income. As their total earnings declined 20 per cent and their taxes increased 21 per cent, the difference between the operating deficit incurred in 1921 and the net operating income earned in 1931 obviously was due entirely to the reduction of 32 per cent in operating expenses.

It will be observed that in the first two months of 1931 the taxes collected by the national, state and local governments from the railways—$54,250,000—were only 11 per cent less than the total net operating income—$61,000,000—earned by them from which to pay interest and dividends upon all their outstanding bonds, stocks and other securities. No facts could better illustrate the burden upon business that has been imposed by the enormous increase in government expenditures within recent years or the magnitude of the obstacle to a revival of general business constituted by the resulting increase in taxes.

* * *

Near Cafetal, S. L. P., on the National of Mexico



Automatic Signal Bridge at 112th Street

N. Y. C. Re-Signals Tracks Entering Grand Central Terminal

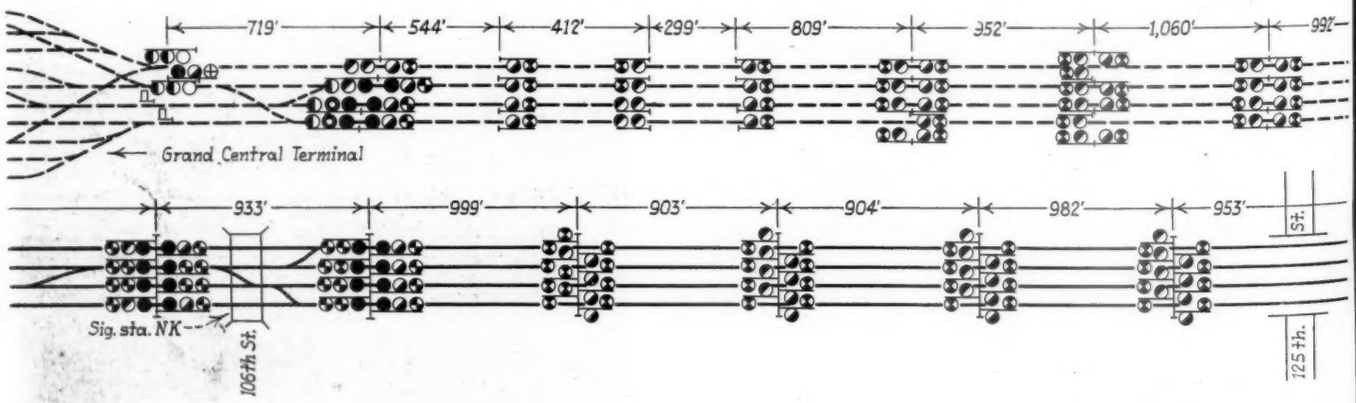
Train operation in either direction on each of four tracks facilitates traffic and increases track capacity

IN order to facilitate train movements and to increase the track capacity into and out of the Grand Central Terminal, New York, during the rush hours of the day, the New York Central has revised the track layout and has just put in service a complete re-signaling of the five-mile four-track throat to the terminal, extending north to Mott Haven Junction on the north side of the city.

Track Layout

The track layout at the Grand Central terminal is entirely underground, on two levels. The upper level, with 41 tracks, 31 of which are served by platforms, is used primarily by through trains, while the lower level with 25 tracks, 17 served by platforms, is used mainly by suburban trains. This layout is located between 42nd and 50th streets, all tracks converging to the north through several interlockings to a four-track line north from 56th street to Mott Haven Junction. From 56th to 96th street, these tracks are in a tunnel under Park avenue and from 98th street to 135th street they are on an elevated structure, beyond which they drop off on an embankment to 140th street, where they enter a depression which continues through Mott Haven. Confined in this manner to a fixed right-of-way, hemmed in on both sides by developed property, the difficulty and impracticability of constructing additional tracks in this territory is readily evident.

At the time the new terminal was built and electrical propulsion provided in this territory in 1907, the four-track territory between 56th street and Mott Haven was equipped with new a-c. signals spaced from 1,100 ft. to



Track and Signal Plan of the Territory

1,300 ft. apart, with one block overlaps. The signals in the tunnel were the two-position color-light type, giving indications same as to lower-quadrant home and distant signals. In the open, three-position upper-quadrant semaphore signals were used. Tracks 1 and 3, the two on the right going north were signaled for northbound movements and Tracks 2 and 4 were signaled for southbound movements. An interlocking plant, NK, including five crossovers, was located at 106th street and another plant, DB, protected the drawbridge over the Harlem river at 134th street.

Traffic Heavy

The Grand Central Terminal serves not only the New York Central, but also the New York, New Haven & Hartford, both roads having heavy through passenger and suburban traffic in and out of New York. Under normal conditions, an average of approximately 680 train movements are made within the terminal each day, while during holiday seasons, as many as 850 movements have been made in 24 hours. The normal heavy traffic periods of the day are between 7 a. m. and 10 a. m. and between 3 p. m. and 6 p. m., when an average of 155 to 166 trains are moved in and out of the terminal.

A large number of the train movements within the terminal are due to the fact that Grand Central is essentially a dead-end layout with limited facilities for storing cars within the terminal. All coach storage tracks, with the exception of a limited number for holding suburban coaches on the lower level directly within the terminal, are located in the Mott Haven yard. Therefore, the number of empty train movements in the terminal territory is approximately 20 per cent of the revenue train movements. Further complications are brought about by the fact that the arrival and departure of a number of through trains occurs during the peak of the suburban traffic inbound in the morning and outbound in the evening. Then too, the necessity for the stopping of certain through and suburban trains at the 125th and 138th street stations within this territory, decreases the headway and thereby slows up operation. By 1923, with the original layout and signal system within and approaching the terminal still in effect, train movements became so heavy and delays so frequent that something had to be done to increase the track capacity.

The first improvement, which was completed in July, 1924, was to provide additional three-position color-light signals on Track 4 to permit the movement of trains in either direction on this track the same as on a single-track line. Track 4 was selected for this either-direction operation on account of the track arrangement at Mott Haven being such that trains could be routed to and from this track with minimum conflict with other train movements. During periods when the preponderance of traffic was inbound, this track was used for incoming trains and vice versa. The improvement in train operation afforded by this change was evident at once. Later, however, study was given to the possibility of improving the existing track layout and to either-direction operation on all four tracks through the installation of a new signal system.

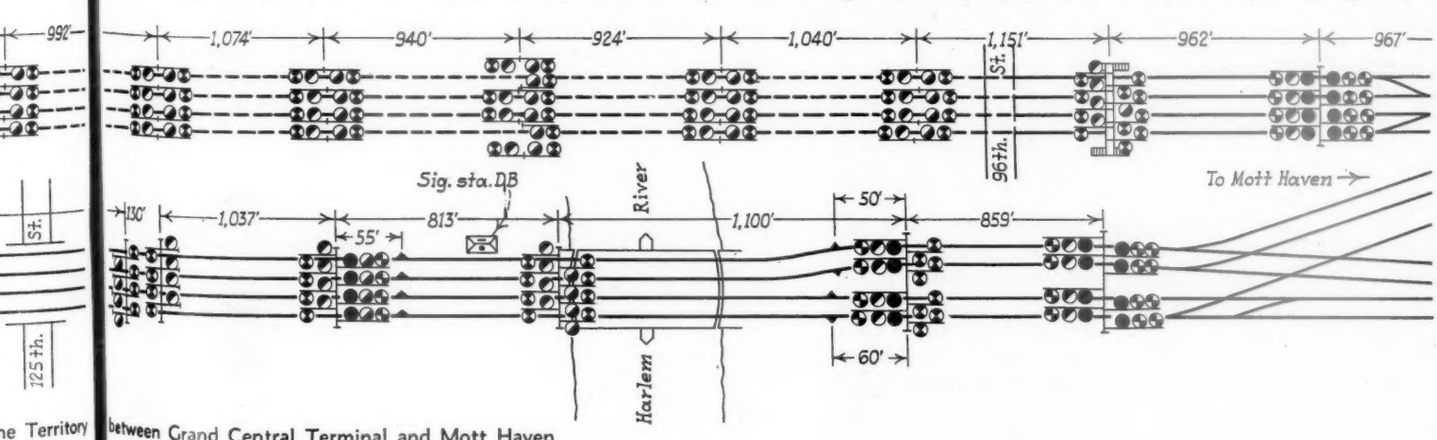
Improved Track Layout

These extensive changes were authorized early in 1929 and actual field work was started in October of the same year. In order to facilitate the routing of trains in either direction on all of the tracks, certain changes and additions to the track layout were necessary. At the throat entering the Grand Central layout near

NK Interlocking Station Showing Northbound Signals

56th street a scissors crossing was added and, at NK, 106th street interlocking plant, the five old crossovers were removed and six new ones were provided in a universal layout whereby trains can be routed from any track to any other track within the limits of the plant. All of the new crossovers are No. 18 and about 325 ft. long, which permits crossover movements at 30 m. p. h. with safety and without annoyance to passengers.

This new track arrangement necessitated the entire replacement of the interlocking, including a new signal station, new switch machines, signals and the interlocking machine proper, as well as all relays, wiring distri-



between Grand Central Terminal and Mott Haven

lution, etc. One of the most interesting features in connection with these changes is the new signal station, NK, which is a two-story, steel frame, brick face structure mounted directly over the tracks on a specially constructed signal bridge spanning all four tracks. In this new facility, the upper floor is the operator's room, while the lower is essentially a relay and equipment room. The interlocking at this point is all-electric, with a 48-lever frame and 44 working levers for the six crossovers and 72 signals involved.

A new interlocking station was constructed at DB, 134th street, this station including a four-story brick signal station with two stories above the track level and two below. As at NK, the interlocking is all-electric, the machine having a 32-lever frame and 29 working levers.

At Mott Haven Junction the track layout was extensively revised, several new tracks and numerous crossovers being provided to secure complete flexibility of train movements between the four-track approach to the terminal and the tracks of the Hudson and Harlem divisions, which converge at this point. One of the most disadvantageous features was the abrupt angle of meeting of the tracks of the two divisions, with special No. 7½ turnouts which restricted train movements to 10 m. p. h. To overcome this, the junction of the two divisions' tracks was moved approximately 1,600 ft. to the south, toward Grand Central, by extending the three tracks of the Hudson division this distance. This made possible the use of No. 16 turnouts, permitting a speed of 30 m. p. h. and also made it possible to extend the coach yard leads to Mott Haven yard, which lies in the wye between the tracks of the two divisions, a most desirable improvement. To make these track improvements necessitated the converting of the 144th street viaduct from one crossing five tracks to one crossing nine tracks, the excavation of approximately 2,000 cu.yd. of grading along the west side of the right-of-way, and the constructing of approximately three miles of new tracks. All of this work had to be carefully programmed in order not to interfere with train operation.

These track changes necessitated the construction of an entirely new interlocking plant at Mott Haven Junction, MO, which replaces four existing plants in this vicinity. This new plant, which is the largest and most interesting involved in the work, is all-electric throughout and contains a 260-lever machine.

An Entirely New Signaling System

In order to realize the full benefit from either-direction operation on all four tracks, it was necessary to go beyond the track changes and to install a complete new layout of signaling, re-arranging the block lengths to reduce the spacing between trains. In order to effect the results desired, that is, maximum speed with safety, four-block signal indications are provided. Excepting where interlockings or other local conditions prevent, the new blocks are from 810 to 1,000 ft. long, as compared with a length of from 1,000 to 1,300 ft. in the previous arrangement.

The re-arrangement of the length of the blocks and the introduction of the four-block indication necessitated practically an entire replacement of the track circuit equipment, as well as the control circuits. In all cases new signals of the SA searchlight type were provided. In the tunnel the signals are attached to the side or curtain walls, but in the open all signals are mounted on overhead bridges. Altogether, 26 new signal bridges and one cantilever bridge were constructed, two new sets of signal brackets were provided on the lengthened 144th Street bridge, and alterations were made at two of the existing bridges.

The new system of either-direction signaling was completed and cut into full service recently and the results in expediting train movements have been entirely satisfactory, as is evidenced by a reduction in the delay to trains at Mott Haven Junction and in their running time between Grand Central and the Junction.

Freight Car Loading Increases

WASHINGTON, D. C.

REVENUE freight car loading figures for the week ended April 18 look better than any we have seen for some time, amounting to 760,002 cars. This is an increase of 22,068 cars as compared with the week before, although it is 132,704 cars less than the loading for the corresponding week of last year and 245,878 cars less than that for 1929. All classes of commodities except coal and coke showed increases as compared with the preceding week and grain and grain products showed increases as compared with both preceding years, although all other commodity classifications and all districts showed reductions as compared with both years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended April 18, 1931

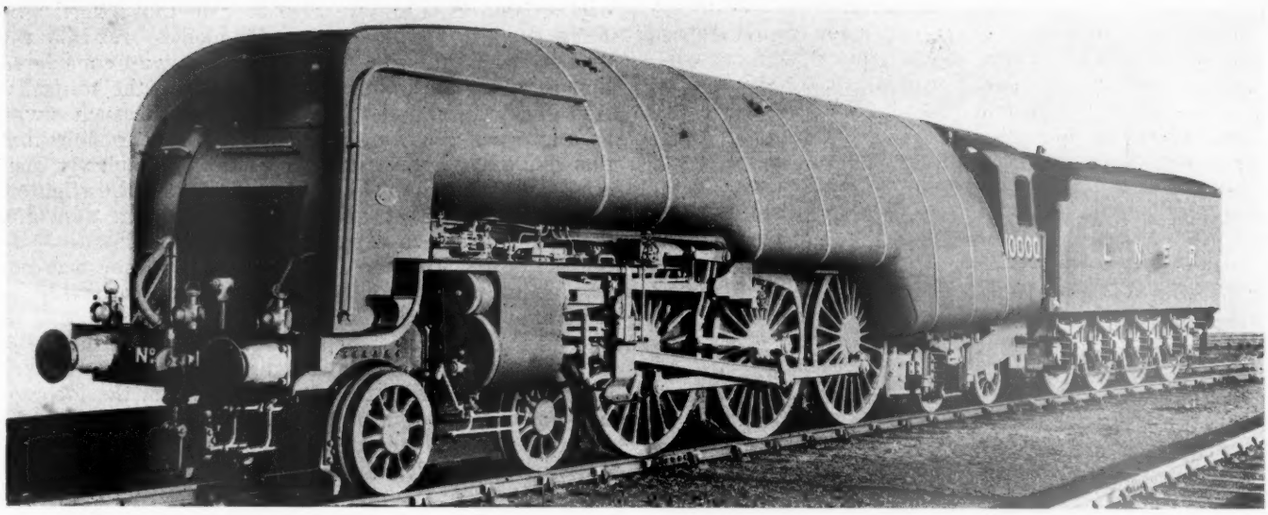
Districts	1931	1930	1929
Eastern	181,023	200,610	236,420
Allegheny	152,181	184,035	206,803
Pocahontas	42,590	52,320	54,642
Southern	121,584	142,704	154,530
Northwestern	87,306	107,423	133,116
Central Western	108,034	128,083	139,775
Southwestern	67,284	77,531	80,594
Total Western Districts	262,624	313,037	353,485
Total All Roads	760,002	892,706	1,005,880
Commodities			
Grain and Grain Products	39,615	37,405	36,762
Live Stock	22,004	23,290	27,995
Coal	110,993	125,061	150,227
Coke	6,382	9,464	11,865
Forest Products	34,103	56,759	68,536
Ore	7,418	13,450	30,307
Merchandise L.C.L.	225,358	249,480	263,893
Miscellaneous	314,129	377,797	416,295
April 18	760,002	892,706	1,005,880
April 11	737,934	911,316	973,152
April 4	728,511	908,059	958,225
March 28	740,079	885,324	969,196
March 21	741,942	875,385	962,400
Cumulative total, 16 weeks	11,492,486	13,981,365	15,090,785

The freight car surplus for the week ended April 15 averaged 622,278 cars, a decrease of 6,426 as compared with the week before. The total included 295,474 box cars, 257,472 coal cars, 30,414 stock cars, and 15,107 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended April 18 totaled 48,689 cars, a decrease from the previous week of 1,025 cars and a decrease of 3,435 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
April 18, 1931	48,689	29,090
April 11, 1931	49,714	27,924
April 4, 1931	45,322	29,494
April 19, 1930	52,124	35,341
Cumulative Totals for Canada		
April 18, 1931	751,520	451,623
April 19, 1930	907,885	588,567
April 20, 1929	998,740	693,991



The L. & N. E. Four-Cylinder Compound Locomotive, the Water-Tube Boiler of Which Develops a Steam Pressure of 450 Lb. per Sq. In.

British 4-6-4 High-Pressure Locomotive*

Features of the London and North Eastern four-cylinder high-pressure locomotive discussed by the designer

By H. N. Gresley, C.B.E.

Chief Mechanical Engineer, London & North Eastern Railway

IN 1930 the London & North Eastern placed in passenger service on its "East Coast Route," a 4-6-4 type high-pressure locomotive, the design of which included many novel innovations.† It was designed by the author and built by the railroad at its Darlington shops. The boiler was built by Messrs. Yarrow & Company, Ltd., Glasgow, Scotland, which firm collaborated with the author in the design of the locomotive.

The locomotive is of four-cylinder compound design, the two high-pressure cylinders being located inside the frames and the two low pressure, outside. The two high-pressure cylinders are of cast steel, and are 12 in. in diameter by 26-in. stroke. These cylinders are connected to the cranked axle of the front drivers. The two low-pressure cylinders are connected to the main or second pair of drivers in the usual manner by outside connecting rods. They have a diameter of 20 in. and a stroke of 26 in. The driving wheels are 80 in. in diameter. The boiler generates steam for the high-pressure cylinders at 450 lb., and it is exhausted to the low-pressure cylinders at about 200 lb. The tractive force of this locomotive, estimated at 85 per cent, is 40,040 lb. Other dimensions and weights are shown in the table.

In designing this locomotive it was thought advisable to be content with what may be regarded as only a moderate increase in boiler pressure to 450 lb. per sq. in. This decision was largely influenced by consideration of maintenance costs and the desirability of advancing by stages. Past experience of revolutionary designs has been that the spectacular advancements have not always been justified by results, and consequently it was deemed wiser to seek progress on a less ambitious scale. It was recognized that as the pressure increases the economies to be expected in fuel consumption are in a diminishing ratio.

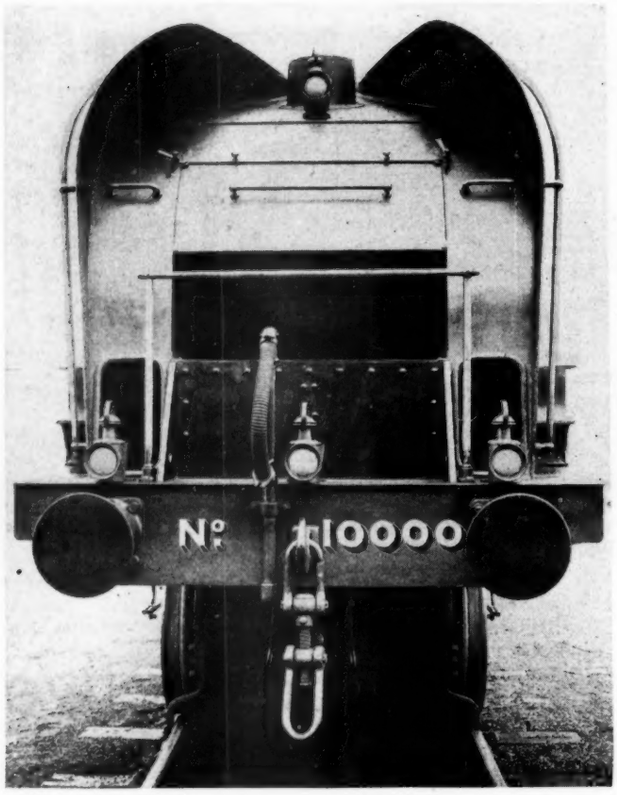
It was decided to adopt a boiler of the water-tube type, in view of the successful application of such boilers to high pressures in marine practice and in large power stations. In September, 1924, the designer approached Harold Yarrow, of Glasgow, and suggested to him a design of boiler of the water-tube type which might be applied to locomotives. Early in 1928 an order was placed with Messrs. Yarrow to proceed with the construction of the boiler, which was completed and tested in October, 1929. The locomotive was completed at the Darlington Works of the L. & N. E., and ran its trial trip on December 12, 1929.

The drums of the boiler are of sufficient size to allow a man to get inside them for the purpose of expanding the tubes. To suit the conditions peculiar to a locomotive, it was felt that tubes of a large diameter only should be used, the tubes in the firebox end of the boiler being 2½ in. external diameter and the tubes in the forward part 2 in. The considerations which govern the design of marine and land boilers are so entirely different from those required in a locomotive boiler, that there is very little similarity between the boiler used on this engine and the ordinary type of water-tube boiler, as can be seen from one of the illustrations.

In the ordinary water-tube boiler resting on foundations, the boiler can expand freely in any direction, and

* An abstract of a paper presented by Mr. Gresley before The Institution of Mechnical Engineers at London, England, January, 1931.

† A brief general description of this locomotive was published in the February 22, 1930, issue of the *Railway Age*, page 473.



The Front End Showing the Air Intake Openings and the Novel Construction Used for Deflecting Upward the Smoke and Steam Emitted from the Short Smoke Stack

the tubes, not being subjected to vibration and racking stresses, are not liable to leak. In a locomotive, however, the boiler must be so secured to the frame that in addition to standing the shocks and vibrations consequent upon the engine running at high speed upon a railway, it must be capable of withstanding the shocks which occur when a locomotive is shunting, or comes in contact with buffer stops, or possibly becomes derailed.

It is necessary also to have due regard for the fact that the boiler provides an important structural element in the construction of a locomotive and contributes to its rigidity. The large steam-drum of the L. & N. E. locomotive forms the backbone of the boiler, from which the tubes and the small drums are suspended. At the forward end this drum is carried in a cast-steel cradle into which it is firmly secured by large strap bolts. Any fore-and-aft movement is entirely prevented by stops which are machined on the lower side of the drum. The cradle in turn is secured to the engine frame by 1-in. steel plates extending downwards inside the main engine frames, to which they are securely riveted. The steel drum must be free to expand longitudinally, and accordingly the back end is secured to the top of a triangular-shaped transverse plate which in turn is secured at its lower extremity to the engine frame. The drum therefore, whilst being free to expand longitudinally, is constrained from side or vertical motion.

The four smaller drums are not supported, but hang from the water-tubes. Rectangular lugs are riveted to the lower side of each of these drums at their forward and back ends. These rectangular lugs are free to slide longitudinally in grooved castings which are secured to the engine frame, but as they do not reach the bottom of the grooves, they are also free to move vertically. These lugs and grooves are provided to restrain the drums from any side movement. It was considered that this was the best way of preventing the transmission of vibration and shocks to the tubes in such a way as might cause leakage. It is interesting to note that this method of construction has been completely successful, in that there has been no case of the slightest leakage occurring at any of the 1,536 points at which the tubes have been expanded in the drums.

In adopting a water-tube boiler, the author was not unmindful of the troubles which might reasonably be expected to result from scale formation in the tubes. Unlike marine and power-house boilers, in which the boiler feed is derived from the condensate and only a very small make-up of fresh water is required, the locomotive boiler requires 100 per cent of make-up water. In order to prevent the formation of scale as far as possible, it was decided to introduce the feed-water at the highest possible temperature. The feed-water is introduced into a chamber at the forward end of the top drum in front of the water tubes and separated from the evaporative portion of the boiler by a weir at a height of about half its diameter.

The water is supplied from the tender by means of two ordinary injectors, and is delivered into this forward space of the top drum, after passing through a form of injector heater. The latter has two sets of cones in which the injector action is repeated by steam from the steam space in the boiler. Heat is absorbed to such an extent by the feed-water that its temperature when delivered into the water chamber is over 400 deg. F. and is therefore only about 50 deg. less than that of the saturated steam in the boiler. Much of the scale and mud is consequently thrown down in the forward portion of the top drum.

But for this arrangement for dealing with the feed-water, considerable trouble due to the formation of scale would have to be expected. As it is, after running some 15,000 miles, a slight deposit of hard scale was found on the inner rows of tubes in the firebox. This was at first not easy to detect, and in consequence about half-a-dozen tubes on each side of the firebox adjacent to the brick arch showed signs of overheating and had to be changed. The experience gained has resulted in the development of an apparatus by which the hardest scale can be readily cut out without damage to the tubes,

Principal Dimensions and Weights of the London and North Eastern 4-6-4 Type Four-Cylinder Compound Locomotive

Railroad	London & North Eastern
Builders	London & North Eastern, and Messrs. Yarrow & Co., Ltd.
Service	Passenger
Rated maximum tractive force	40,040 lb.
Cylinders, diameter and stroke (as modified)	H.p., 10 in. by 26 in. L.p., 20 in. by 26 in.
Valve gear, type	Walschaert
Weights in working order:	
On drivers	140,000 lb.
On front truck	31,400 lb.
On trailing wheels	52,600 lb.
Total engine	224,000 lb.
Total tender	139,800 lb.
Total engine and tender	363,800 lb.
Wheel bases:	
Driving	14 ft. 6 in.
Total engine	40 ft.
Total engine and tender	64 ft. 3⅛ in.
Boiler:	
Type	Yarrow water tube
Steam pressure	450 lb.
Diameter, firebox drums (two)	18 in.
Diameter, steam drum (one)	36 in.
Diameter, barrel drums (two)	19 in.
Length, firebox drums	11 ft. 5⅛ in.
Length, steam drum	27 ft. 11⅝ in.
Length, barrel drums	13 ft. 5¾ in.
Grate area	40 sq. ft.
Tender:	
Type	Corridor
Water capacity	6,000 (imperial) gal.
Fuel capacity	10 (long) tons

and this will probably be necessary when the engine has run some 10,000 to 15,000 miles, according to the class of feed-water used.

On the other hand, experience has also shown that this boiler can be worked for a much longer period than the ordinary type of locomotive boiler before requiring to be washed out. When stationed at Gateshead the locomotive worked express trains from York to Edinburgh and back, involving a daily run of about 420 miles. While other locomotives of the Pacific type on the same run require washing out after running 1,000 to 1,500 miles, this locomotive ran 5,000 miles without washing out, and when examined it was found that the boiler was exceptionally clean and the tubes were in good condition. It was, however, found that the accumulation of mud and scale, which usually occurs above the foundation ring in an ordinary boiler, had fallen into the drums below the grate on each side of the firebox. This material remained in the drums in the form of mud, from which it was easily removed, whereas if it had been in the sides of an ordinary locomotive firebox, much of it would have formed into scale.

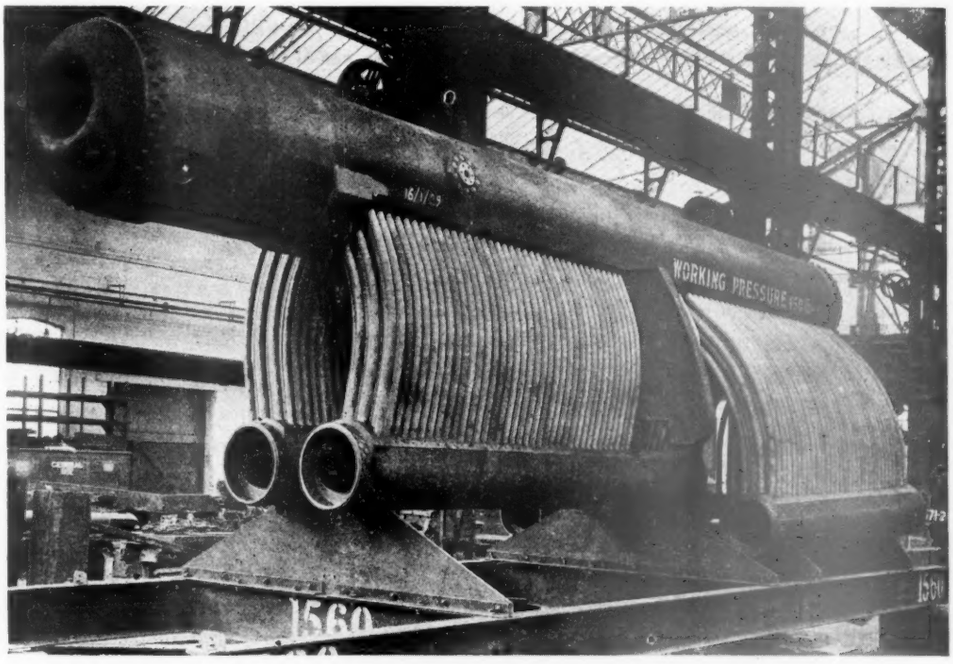
Other means, which will be described later, have been recently embodied, by which the temperature of the water when delivered in the feed-water space in the top drum is further increased before it passes to the evaporative portion of the boiler.

In one of the tests which were conducted with the locomotive, an evaporation of 20,000 lb. per hour at 450 lb. per sq. in. was maintained for a period of four hours by the introduction of a steam jet up the stack. This high rate of evaporation is possible owing to such a large proportion of the heating surface available being subject to direct radiant heat. In the ordinary form of locomotive boiler only the firebox is subject to radiant heat, and the evaporation per square foot of heating surface of the tubes is only about one-fifth of that of the firebox sides.

The superheater elements in this boiler are located in the forward portion of the central flue and are also subject to radiant heat. In order to prevent the flame impinging directly on the ends of the elements, a brick column is provided in the centre of the main flue immediately in front of the brick arch. Notwithstanding this precaution, and owing to the fact that there were no data available as to the effect of radiant heat on superheater elements, the temperature to which the steam was superheated during the preliminary trials was excessive, temperature of 900 deg. F. being obtained. Consequently, the lengths and area of the superheater elements have been reduced so that a temperature of approximately 700 deg. F. can now be obtained, and this is regarded as sufficient. The superheater elements are situated between the boiler and the throttle and are, therefore, always subjected to full boiler pressure. In order to prevent over-heating when the throttle is closed, the steam supplied for auxiliary services is taken from the superheater and passes through a coil of ribbed pipes laid in the feed-water chamber, thus raising further the temperature of the boiler feed-water and at the same time de-superheating the steam. This de-superheated steam is led to the reducing valve where its pressure is reduced to 200 lb. per sq. in. Steam from this reducing valve supplies a manifold pipe on the footplate across the back head of the boiler above the fire door. From this manifold pipe steam at 200 lb. per sq. in. is taken for supplying all the auxiliary services, such as the injector, vacuum and steam brake, reversing gear, steam-sanding, steam-heating, whistle, and turbo-generator. It has been possible to retain the standard steam fittings for all these purposes.

With a pressure of even 450 lb. per sq. in. special designs of boiler fittings and valves have to be used owing to the cutting action of high-pressure steam, but in this engine only the safety-valves, regulators, high-pressure injector and water-gages have had to be made suitable for this pressure.

After the hot gases have passed between the water-tubes they enter the flues located at each side of the boiler. Naturally the walls of these flues are very hot and, in order to reduce their temperature and to make effective use of this heat which otherwise would be wasted, the boiler is surrounded by an air space lying between the casing of the flues and the insulated outer clothing. All the air required for combustion traverses this air space from the intake at the front of the engine to the ashpan, and in so doing its temperature is raised to about 250 deg. F. It has been found that even when



The Boiler of the L. & N. E. High-Pressure Locomotive—The Large Steam Drum at the Top Is Free To Expand Longitudinally But Is Constrained from Vertical or Side Movement—The Four Small Drums Are Not Supported But Are Suspended from the Top Drum by Means of the Water Tubes

working hard it has not been necessary to supplement this supply of hot air by opening the ashpan door. Preheating the whole of the air supply is bound to augment the thermal efficiency of the boiler.

The only other feature of the boiler which calls for comment is the construction of the front end and smokestack. Incidentally, the apparent absence of the stack has caused more public comment than any other feature of the locomotive. In order to provide sufficient length for the water tubes, it was necessary to have the top steam drum as high as the limits imposed by the load gage permit. Consequently there was no room for a stack of the conventional type. Locomotives having large high-pitched boilers can only have very short stacks and trouble has been experienced in such locomotives owing to smoke and steam beating down on the front windows of the cab and interfering with the engine crew's view of signals. The designer enlisted the assistance of Professor W. E. Dalby and constructed a wooden model of the locomotive. This model was placed in an air flume, and powdered chalk was blown up the stack at the same time as a current of air was drawn through the flume at 50 m. p. h. Observations through a glass window showed the course pursued by the powdered chalk, and as a result of various modifications, the design finally adopted was arrived at. In this design the whole of the powdered chalk was lifted sufficiently to clear the cab windows, and it is satisfactory to record that in actual service the smoke and steam, whether running at slow or at high speeds, is deflected upwards sufficiently to clear the cab, and in no way obstructs the vision of the engine crew.

As originally built the locomotive had two high-pressure cylinders 12 in. in diameter, and two low-pressure cylinders each 20 in. in diameter, all cylinders having a 26-in. stroke. It has been found that by reducing the diameter of the high-pressure cylinders to 10 in. a more equal distribution of work between the high-pressure and low-pressure cylinders results.

Various minor alterations and adjustments have had

(*Continued on page 868*)

Ranking of Railways in Traffic Revenues

WASHINGTON, D. C.

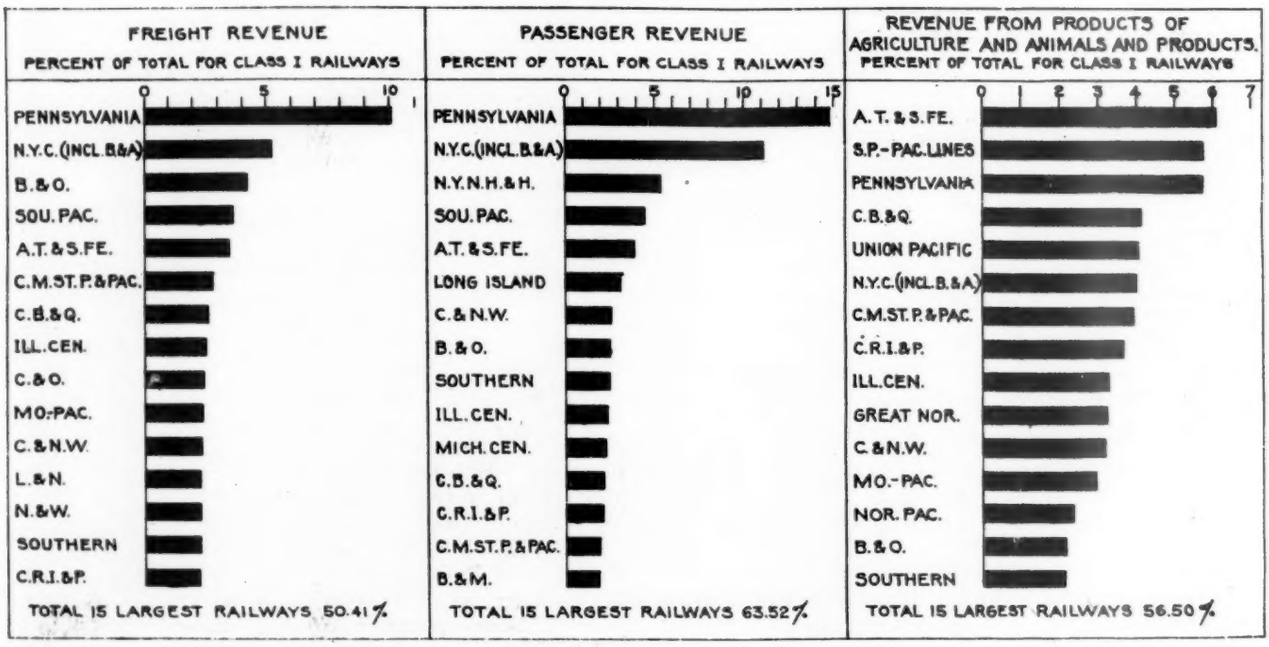
THE Bureau of Statistics of the Interstate Commerce Commission has compiled an interesting chart showing the relative revenues of 15 railways ranking highest in freight revenue, passenger revenue and revenue from farm products in the year 1929. The chart shows that the 15 largest railways from a freight standpoint handled in that year 50.41 per cent of the freight traffic of Class I railways (as measured by revenues), while the 15 largest from a passenger standpoint earned 63.52 per cent of the total passenger revenues and the 15 largest from the farm products standpoint earned 56.5 per cent of the total revenue from that source.

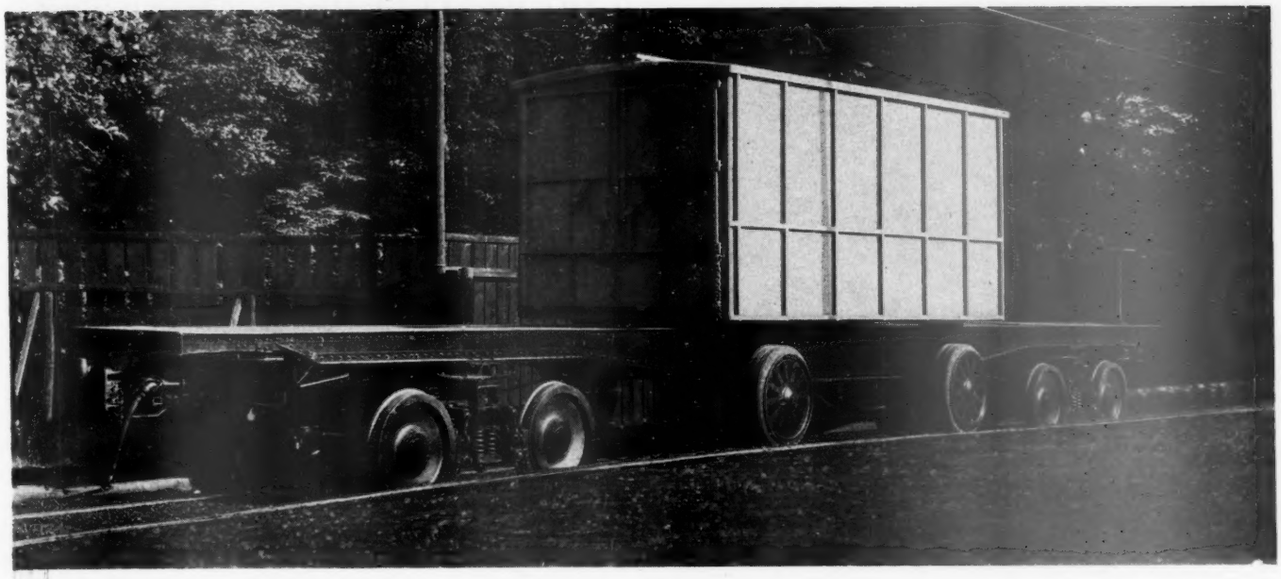
Leading Roads

The Pennsylvania heads the lists as to freight and passenger revenues, with a little over 10 per cent of the freight revenue and nearly 15 per cent of the passenger revenue, while the Atchison, Topeka & Santa Fe heads the list as to farm products, with a little over 6 per cent.

The New York Central, including the Boston & Albany, stands second as to freight and passenger revenue, but the chart was made as of a date when its reports did not include the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis. It will be noted that all but three of the 15 largest freight carriers were included in one or both of the other two groups, the exceptions being the Chesapeake & Ohio, Louisville & Nashville and Norfolk & Western, which are extensive coal carriers. Also the New Haven, the Long Island, the Michigan Central and the Boston & Maine were included in the 15 largest passenger carriers but not in either of the lists compiled as to freight revenue.

RELATIVE REVENUES OF 15 RAILWAYS RANKING HIGHEST IN FREIGHT REVENUE, PASSENGER REVENUE AND REVENUE FROM FARM PRODUCTS - 1929.





Bonner Railwagon With Its Highway Wheels on a Ramp Slightly Higher Than Track Which It Straddles, Enabling Rail Car To Be Run Under

Simplifying Road-Rail Transfer

Highway trailer designed for efficient inter-city movement by rail—Wayside facilities inexpensive

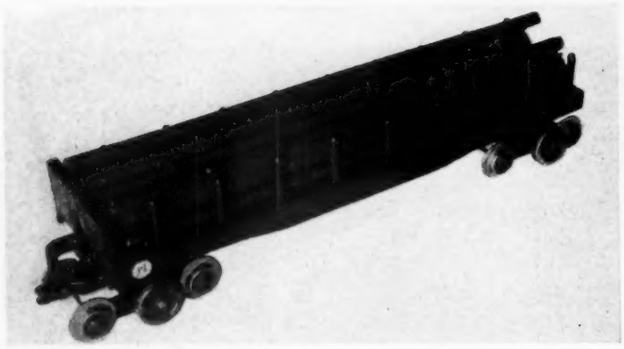
A FORM of unit freight container known as the Bonner Railwagon, which is designed with the view of bringing about an easy, quick and inexpensive interchange between railway and highway transport without elaborate unloading facilities, has been in successful service for some time on an electric railway in Ohio. It is generally recognized that railway transportation is much cheaper than that by highway for the line-haul. The invasion of motor trucks into this phase of transport has resulted in most cases because trucks can give door-to-door service involving the elimination of four handlings of the freight, viz.—(1) from the local truck to the freight house platform; (2) from the platform to the car; (3) at destination, from the car to the freight house platform; and, (4) from the platform to the local truck. Direct truck transportation from the door of the shipper to that of the consignee, by contrast, involves only the loading at the start and unloading at destination. Fewer handlings and smaller units of transportation also permit less elaborate packing and crating. Thus it is that the great economy of railway line-haul is often outweighed by its greater terminal handling costs and by more expensive packing and crating.

Saves Four Handlings of Freight

The Bonner Railwagon is virtually a highway trailer which can be wheeled to straddle lengthwise a specially designed railway car with a minimum of effort and with a very slight investment in wayside equipment. It thus avoids the four additional handlings necessary when l.c.l. freight is moved by railway in the usual manner, with local truck hauls at point of origin and destination. By the Bonner system freight reaches the consignee, its bulk unbroken, in the same vehicle—a highway trailer—in which it was loaded at the shipper's place of business. Contrary to ordinary truck transport, however, it negotiates the major part of the distance between shipper and consignee, not on the highways, but rigidly mounted on a railway car.

The Railwagon, instead of being carried on axles in the ordinary manner, has each wheel sprung and mounted in a pedestal extending downward from the body of the vehicle, there being no connecting axle between the two wheels of each pair. The two forward pedestals are trussed to a cross member which pivots on an adaptation of the fifth wheel principle so that the forward wheels swing and the vehicle may be pulled as a full trailer, although it is also adaptable to operation as a semi-trailer.

Such mounting of the wheels leaves entirely clear the space usually occupied by axles. To load the Railwagons onto railway cars they are simply moved ahead at any angle and drawn up longitudinally over the track with the road wheels on low ramps (which may be of wood, concrete, or other material) which are fitted to the outer ends of the ties to a height of a few inches above the top of the rails. When the Railwagons are thus in place over the track, the specially designed railway cars are pushed under them. The Railwagons are then locked in place and the cars are ready to move. As they do so, the Railwagons, being locked in position, move with them on their highway wheels until the end of the ramps is

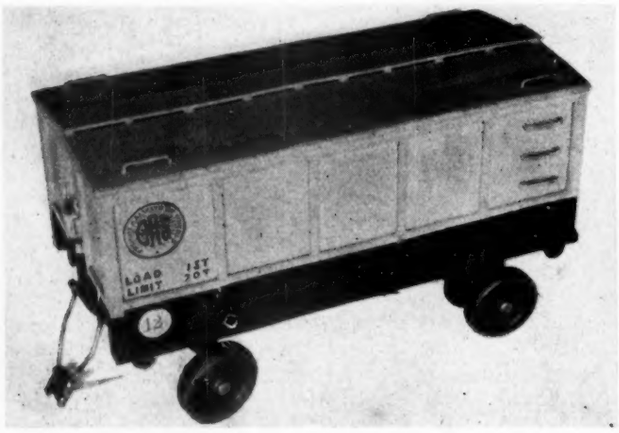


Model of Long Railwagon Designed to Handle Structural Steel or Pipe from Mill to Place of Use Without Intermediate Disturbance of Lading

reached. The wagons then settle down on the rail cars, their highway wheels clearing the tops of the ties by several inches. To transfer the Railwagons to the highway at destination, the cars are simply run onto a track equipped with ramps on the ends of the ties. The ramp engages the highway wheels lifting the weight of the Railwagons off of the rail cars. They are then unlocked and the rail cars moved from under them. They may then be moved away by any form of highway tractor. A whole trainload of Railwagons can thus be unloaded for highway movement by the movement of the train to and from a track equipped with the ramps.

The rail car used for transport of the Railwagons consists of little more than an underframe and a pair of trucks. The bearings of the latter, however, must be inside to permit the wagon wheels to clear them. It is claimed that the equipment is designed to comply with all highway and railway restrictions and clearances and that all safety appliances may be used.

The operation of the Railwagons by an electric railway, the Lake Shore Electric, between Cleveland, Ohio, and Toledo, is reported to be highly successful, enabling the line to capture much freight business formerly moving by truck in its territory. One of the illustrations shows a Railwagon on a ramp with an electric railway car beneath it. Others, which are photographs of models rather than actual operations, portray other details of the equipment. Working models of the device in many different uses are being displayed by Col. J. C. Bonner, president of the company which is developing it, at the Hotel New Yorker, New York.



Railwagon Off of Rails for Movement as a Highway Trailer

Penna. Will Seek Authority To Transport Truck Bodies

THE Pennsylvania intends shortly to seek authority for a tariff under which it will offer to move motor truck bodies between centers of population at rates considerably lower than the cost of such movement over the highway. This intention was disclosed by Elisha Lee, vice-president of the railroad, in an address delivered before the National Petroleum Association in Cleveland, Ohio, on April 24.

"Competition of trucks with our railroad, in line haul service," said Mr. Lee, "is practically limited to 250 mile zones, reaching a peak at about 100 miles. Conditions were therefore carefully studied between Philadelphia and New York, where the distance is about the latter figure and the volume of through trucking very large. Conferences with leading truck operators developed that the actual cost to them of a loaded run between these cities, with 20-foot truck bodies, is about 30 cents a mile. We made careful studies to determine a figure at which we could transport detachable loaded bodies of that length, by rail, over the same route. The interesting result has been that we find we can do it remuneratively for 15 cents a mile.

"We intend in the near future to ask authority for the initiation of such a service in co-operation and co-ordination with truck lines now operating. The trucker will collect and deliver in both cities between the rail-stations and the store-door of shipper or consignee. We will carry his truck body for him between the cities for half what it costs under his own power. This will allow the trucker to earn more satisfactory profits. It will bring back remunerative business to the rails. It will make possible performance of the whole service at less cost to the shipper than at present. Highway transport, rail transport, and the public alike will be benefited—a happy example of the possibilities which lie in co-ordinated service. . . . Highway transport offers the railroads an opportunity to expand their service into new fields and increase the scope of their usefulness. The policies and activities of the Pennsylvania management are based entirely upon that theory."

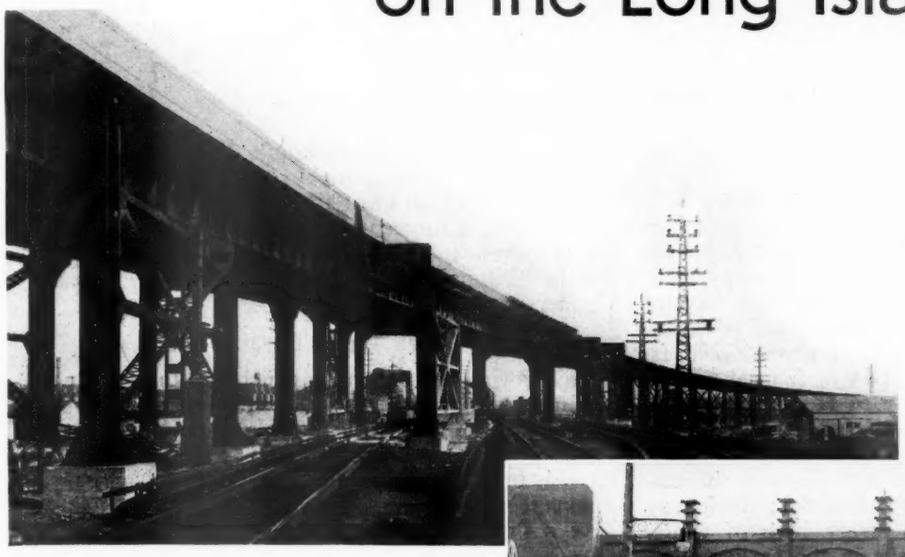
Mr. Lee outlined the company's activities in extending its services into bus and airplane transport and of its desire, if permitted, to engage also in transport by inland waterways.

"Water transportation," he said, "offers a complicated situation in the effort to establish proper co-ordination with railroads. It involves the unsound element of subsidized competition and discriminatory restrictions, to cure which changes in our laws are necessary. On the inland waterways, constructed by dredging and canalizing miles of our interior rivers at the cost of hundreds of millions of dollars raised by taxation, the government has elected to operate an extensive barge system on the Mississippi and Warrior Rivers, and carries freight at rates which many competent authorities believe are much below the true cost of the service. These barges directly compete against the railroads, which, however, are compelled to make through rates with them and short-haul their own traffic. As a crowning incongruity, the Dennison Act empowers the War Department to sell these barge lines to private operators, with the single restriction that no railroad company can have any interest in them, direct or indirect.

(*Continued on page 876*)

Grade Crossing Elimination on the Long Island

Make rapid progress on $6,500,000 track elevation project at Jamaica, N. Y., involving eight tracks and ten streets



Above—The Double-Track Jump-Over of the Montauk Division. Right—The Steel Girder Bridges Were Faced with Concrete Arches

CONFRONTED by conditions which make grade crossings more hazardous today than ever before, the Long Island Railroad, with its 397 miles of lines, is co-operating with the state, county and municipal authorities in a program of grade crossing elimination, which, during 1929 and 1930, included, in addition to numerous isolated projects of moderate size, four large projects, each involving several crossings and expenditures in excess of $2,000,000.

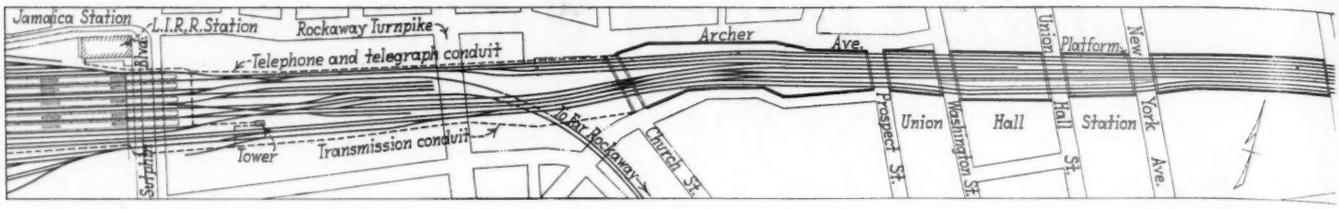
The largest of these projects, which is now being brought to completion at Jamaica, N. Y., in the Borough of Queens, New York City, has involved the raising of a six-track line carrying an average of 500 trains a day, over a distance of about 1¼ miles. As a result of this work, which will cost in the neighborhood of $6,500,000, a six-track system has been expanded into eight high-level tracks, six of the most heavily traveled grade crossings on the road have been eliminated, three streets have been transferred from antiquated overhead bridges to wide, level-approach underpasses, and a new underpass has been provided for another street which formerly stopped at the right-of-way line.

Hazardous Conditions at Jamaica

Prior to the present improvement work at Jamaica, grade crossing conditions on this section of line were most severe, involving a six-track railroad carrying as many as 650 trains a day in the peak of summer travel, and six heavily traveled streets crossing the tracks at grade, some of which were used as the main connecting links between New York City proper and the highways serving the center and the south shore of Long Island. All of these street crossings were protected with flashing-light signals, bells, manually-operated gates, a watchman and a railroad police officer in uniform. In addition, all of the watchmen's shanties were linked in a bell enunciator system to warn the watchman of approaching trains.

Under this protection, accidents were infrequent on the crossings in Jamaica, but with hundreds of vehicles crowding across the tracks between closely scheduled trains, the hazard was considerable to both highway traffic and train operation, particularly between 7:30 and 8:30 in the morning and between 5:30 and 6:50 in the evening, in each of which periods there was an average of about 30 train movements.

The tracks through Jamaica extended in a generally east and west direction on a closely confined right-of-way ranging from 115 ft. to 160 ft. in width. About 1,200 ft. east of the Jamaica station, with its 12 tracks and 5 island transfer platforms, which were raised in an earlier project, the tracks, with the exception of two, converged into a six-track system and began to descend to the east on a grade of about two per cent. The other two tracks, which served the Far Rockaway branch of the road, dropped off immediately east of the station to an underpass under the other tracks



West Half of the Grade Separation Territory

and continued to the southeast, entirely outside the limits of the present Jamaica improvement.

All of the tracks through Jamaica were electrified, with the third-rail contact system, although some steam trains were operated through the station. Of the six tracks involved in the Jamaica work, two were Main Line division tracks, which continued due east beyond the limits of the work; two were Montauk division tracks, swinging off to the southeast about 6,200 ft. east of the Jamaica station; and two were used mainly as freight tracks, leading directly to Holban yard, the west end of which is about 7,400 ft. east of the Jamaica station.

Proceeding eastward down the east slope of the station approach, the six tracks first passed over Rockaway turnpike and then over Church street, both of which had been carried under the tracks in the earlier elimination project, and then continued downward to a level about 26 ft. below the Jamaica station, crossing under old pin-connected steel truss bridges carrying Prospect, Washington and Union Hall streets. Between Washington and Union Hall streets there was a local station with a timber platform along the north side of the right-of-way and an intermediate platform of timber construction between the Main Line and Montauk division tracks.

Continuing east at an elevation about 21 ft. below the Jamaica station level, New York avenue, Puntine, Smith and Canal streets and Brenton avenue were crossed in succession at grades by all six tracks, and, in addition, South street was crossed at grade by the two tracks of the Montauk division as they swung off to the southeast.

Ten Separated Crossings Provided

In the present work, which has been carried out entirely by track elevation, the overhead crossings of Prospect, Washington and Union Hall streets have disappeared, and these streets, as well as all of the other streets which crossed the tracks at grade, now extend under the railroad in wide subways. In addition, Cooper avenue, about 6,500 ft. east of the Jamaica station, was opened under the tracks. In effecting the track elevation, the entire right-of-way east of the Jamaica station was raised on an earth fill supported on both sides by reinforced concrete retaining walls.

In the new track arrangement, eight tracks replace the six formerly at street grade. All of these tracks are on 13-ft. centers and at approximately the same grade as far east as Brenton avenue, but at that point the two tracks of the Montauk division begin to rise on a two per cent grade to a viaduct crossing over the four tracks south of them. All of the other tracks continue on a descent of 0.4 per cent, crossing over Cooper avenue, which has been depressed, and run out to the original track grade about 1,200 ft. east of Cooper avenue.

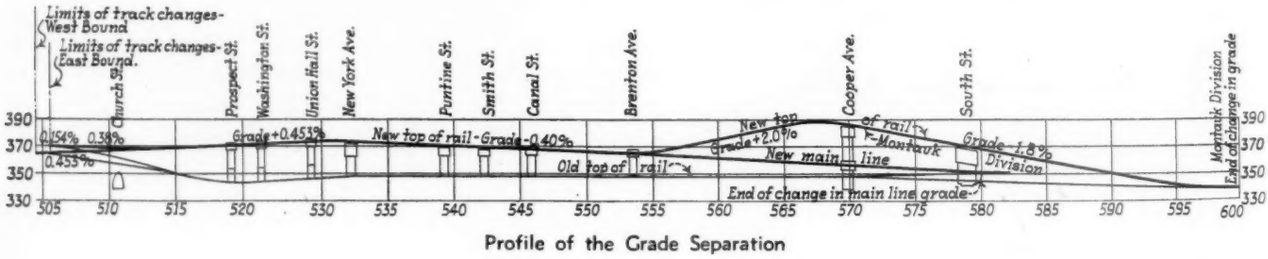
Three Tracks Elevated First

In carrying out the work, which had to be done without interfering with the heavy rail traffic through Jamaica, and with as little inconvenience to street traffic as possible, the plan adopted was to shift all rail movements to the three northerly tracks and then to complete the raising of three tracks along the south side of the right-of-way, following which it would then be possible to put the new high-level tracks in service and release the north side of the right-of-way for filling operations. Following this plan, the construction of retaining walls, and the south halves of the abutments for the street bridges, and grading operations began almost simultaneously. To facilitate train movements on the three tracks left in service, the center track was temporarily signaled in both directions to permit alternate east and westbound operation with the shifting of the direction of peak movement during the day.

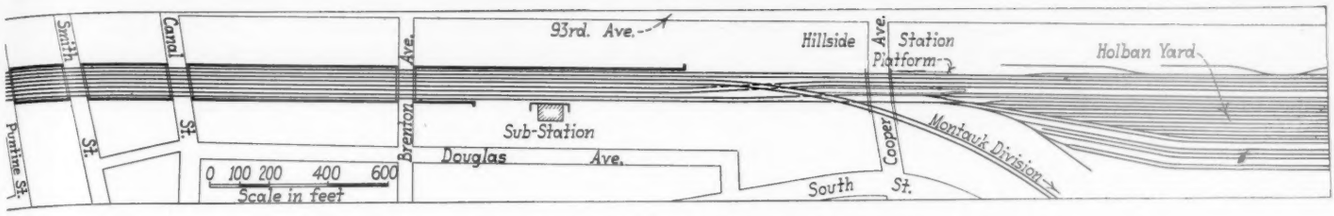
The 4000 ft. of retaining wall along the south side of the right-of-way is of reinforced concrete construction, and ranges from a height of 20 ft., just south of Brenton avenue, to a maximum height of 36 ft. at New York avenue. This wall has a spread footing on a relatively shallow foundation. At many points, however, where trouble was anticipated in the event of future excavations for buildings on the private property adjacent to the wall, a toe wall was carried down from the face of the wall proper to a depth of 10 ft.

The abutments for the street bridges are of gravity section with some bond reinforcing, and were constructed in much the same manner as the South-side retaining wall. In each case, the abutments provided during the south-side work were made of sufficient length to carry four-track bridges, this being done in spite of the fact that it was only possible to provide an initial layout of three tracks at the high level.

Grading was done entirely with motor trucks of from two to six yards capacity, as many as 50 trucks having been employed at a time. The material used in filling consisted mainly of sand, gravel and clay secured from private properties and private excavation work in and about Jamaica. By leaving out a section of the



Profile of the Grade Separation



East Half of the Territory, Showing the Montauk Division Jump-Over

retaining wall between streets in each block, usually near one of the bridge abutments, the trucks had ready access to the areas to be filled and were able to complete the fill between streets rapidly and without difficulty, except for the small portions immediately in the vicinity of the wall openings. When the wall closures were made and the bridges over the streets were completed sufficiently to enable the laying of a plank roadway over the steelwork, the trucks completed the remaining fill by operating over the bridges and that part of the fill already brought up to grade.

One of the most interesting features in connection with the grading was the successful use made of timber cribbing to retain the north face of the south-side fill. This cribbing, which extended over a distance of 4,200 ft. and ranged in height from 6 ft. to a maximum of 24 ft. at New York avenue, ws built up entirely of old crossties, tied together at intervals with long new timbers. Approximately 25,000 ties which had been released in connection with tie renewals over the railroad, were used in the crib wall construction. Up to a height of about 14 ft., single crib construction was used, but where the height exceeded this amount, double-faced cribbing was used in the bottom half of the wall. In the higher sections of the wall, the two-crib construction extended as high as 14 ft., the rear crib being interlocked securely with the face crib.

Throughout the crib wall a face batter of 1 in 4 was maintained, and new 7-in. by 9-in. by 16-ft. timbers were used to hold the crossties together both longitudinally and transversely, these being inserted in the cribbing at intervals of about five feet in height. Furthermore, all joints in the cribbing were secured by ⅜-in. by 12-in. boatspikes, and, in the higher sections, the top of the wall was anchored back to the lower part of the rear crib by ¾-in. steel cables at intervals of about 20 ft.

Ruse Insured Safety Around Power Cables

While commenting on the success with which the crib wall was constructed, it is interesting to note that no personal injuries resulted in the handling of this timber, and, in fact, that not a single personal injury has been sustained by the forces employed in the track elevation work. This is particularly significant in view of the character of the work, the electrified operation of trains, and the fact that high tension lines carrying 33,000 volts extended directly over the alinement of the retaining wall along the south side of the right-of-way. With regard to this latter hazard which could not be removed until the wall was completed, the cables were as close as 10 ft. from the top of the wall and the steel towers supporting the cables had to be encased directly in the masonry of the walls. Later, the overhead lines were placed in fibre ducts which were encased in a concrete box laid along a shelf provided in the back face of the retaining wall near the top.

The great hazard presented by the power lines was to the operation of the dump trucks and to the men placing the reinforcing steel in the retaining wall. To induce the greatest possible caution on the part of the workmen employed under or near these lines, and to provide a wide margin of safety for their welfare, an interesting expedient was resorted to which proved highly successful. This was to string two dummy cables two feet below the lowest of the live cables, unknown to the workmen. The use of this expedient reduced the working clearance by two feet, but provided a most desirable factor of safety around an unavoidably hazardous situation.

Girder Bridges Have Concrete Arch Faces

The erection of the steelwork for the street bridges was begun as soon as the abutments were completed, and sections of the bridges were completed in ample time to permit trucking over them during the final stages of the filling work. All of the bridges in the south half of the work were constructed for four tracks, in spite of the fact that only three-track operation was contemplated in the first stage of the track elevation work. The bridges are of the through plate girder type, with a concrete slab deck supported on the steel floor system, the bridge slabs being covered with waterproofing membrane protected with Elastite. The average length of the bridge spans is 60 ft., while the longest span, that over Cooper avenue, is 70 ft.

A noteworthy feature in connection with seven of the bridges is the reinforced concrete arch face provided on each side to hide the steelwork and to enhance the appearance of the otherwise satisfactory type of bridge construction. These arches, which are carried in part by the outside girders, are flanked on each end by concrete pilasters, and are paneled pleasingly. The arches have an important utilitarian value in that they carry within themselves a series of fibre cable ducts, which are linked up with duct lines carried by retaining walls.

Looking East Along a Section of the High Tie Crib Wall Constructed to Permit Train Operation and Filling at the Same Time

With the completion of the bridges and the three-track fill, effort was concentrated on the high-level track construction. As many as 1,000 men were brought together in this work, this large force including signal and electrical department men as well as trackmen. All track construction is with 130-lb. rail, treated ties and cinder ballast, and with the fill so well compacted by the motor trucks and smoothed off with bulldozers, the trackwork was greatly speeded up.

In three distinct steps on June 21, 22 and 23, the three high-level tracks were cut into service, this having been done about four months ahead of the best schedule which had been contemplated at the start of the work. It is said that among a number of factors which contributed toward the rapid progress of the work, the most important was the use of the motor trucks in the grading operations.

While the work on the south half of the project was being brought to a close, much other work was under progress, but with the removal of traffic from the north half of the right-of-way, the remaining work on the project was started. The retaining wall and the north halves of the bridge abutments were constructed while the old tracks were being removed, so that grading operations could proceed at the earliest date. Furthermore, the north halves of the bridges were erected in advance of the completion of the grading so that the trucks could use them in completing the filling operations.

The Montauk Two-Track Jump-Over

At the easterly end of the project, the most interesting work was the construction of the Montauk division jump-over of the two eastbound main line tracks and the two freight tracks. In effecting this crossover at separated grades, the Montauk division tracks begin their ascent at a point just west of Brenton avenue and are carried upward on an earth fill retained on both sides by retaining walls, on a uniform grade of two per cent. About 650 ft. east of Brenton avenue, while still on tangent between the main line tracks, and at an elevation of about 14 ft. above these tracks, the Montauk tracks are transferred to a steel viaduct, which has a length of 1,920 ft. Three hundred feet east of the west end of this structure, its alinement begins a compounded curve of 3 deg. 10 min. maximum, to the southeast, crossing over the four south-side tracks and Cooper avenue, and then, about 800 ft. further to the southeast, South street. Beyond South street the tracks are carried down to the level of the old Montauk division tracks on an earth fill 2000 ft. long with unretained side slopes.

The highest point in the jump-over viaduct is about 140 ft. west of Cooper avenue, directly over the main and freight tracks, where the top of the rail of the Montauk tracks is 30 ft. above the level of the new tracks beneath and 35 ft. above the level of the old tracks. From this point southeast, the Montauk tracks descend on a uniform grade of 1.8 per cent, crossing South street about 27 ft. above the pavement.

In the retained approach fill at the west end of the viaduct, the retaining walls, which increase uniformly in height from 7.3 to 20.1 ft., are of reinforced concrete construction with a gravity section which varies slightly in shape as height is gained. Both walls were constructed on about 10 ft. of new fill, and, therefore, in order to give them increased stability, they are tied together with deep reinforced concrete beams at intervals of from 16½ ft. to 10 ft. the beams having been cast integral with the walls themselves.

The steel viaduct is of the more or less usual type of construction, with its structural steel bents spaced 40 ft. apart on center line in practically all cases. With the exception of a few of the bents at the track crossings and at Cooper avenue, where there are three or four columns to the bent, all of the bents are formed with two columns. All of the columns are carried on concrete pedestals with footings one foot below the original ground level and heights ranging from 12 ft. to 15 ft. The deck of the viaduct is of reinforced concrete.

The Jamaica work as a whole has involved the handling of approximately 500,000 cu. yd. of fill, the erection of about 6,000 tons of structural steel and the pouring of approximately 75,000 cu. yd. of concrete, in which a total of 1,858,000 lb. of steel reinforcing was used. In addition, approximately 100,000 lin. ft. of old tracks were removed and approximately 200,000 lin. ft. of new tracks have been laid.

All of this work has been carried out under the general direction of A. C. Watson, chief engineer of the New York zone of the Pennsylvania, and under the direct supervision of George Patton, assistant chief engineer, New York zone. George R. Klein, assistant engineer, has been in actual charge of construction, while J. M. Fair, division engineer, has had general supervision over all of the trackwork. All of the work, with the exception of the trackwork and the electrical and signal work which were done by company forces, has been done under contract by Foley Brothers, Inc., St. Paul, Minn., who sublet the erection of steelwork to the National Bridge Works, Long Island City, N. Y. All structural steel was furnished by the American Bridge Company.

British High-Pressure Locomotive

(*Continued from page 862*)

to be made since the engine was built, but with the exception of reducing the diameter of the high-pressure cylinders and reducing the heating surface of the superheater, it has not been necessary to alter any of its main features.

The locomotive has hauled trains weighing over 500 (long) tons for long distances at express speeds with consistent success and reliability and, although it has not been possible so far to carry out any extensive trials, there is every indication that it will prove more economical in fuel consumption than express engines of the latest normal types. Any economy effected in maintenance cost will only become fully apparent after the engine has run a few years.

It has been ascertained that the cost of a water-tube boiler similar to that used on this locomotive will not be appreciably greater than that of the ordinary wide firebox used on Pacific type locomotives. The most expensive components of the water-tube boiler are the solid-forged steam and water drums. These are not subjected to the action of the fire, and consequently may be expected to have a long life. On the wide firebox type of ordinary boiler the copper firebox is the most costly section, and it is well known that its life is short and its renewal is an expensive item. Again, in the ordinary type of locomotive boiler, tubes and firebox stays are sources of trouble involving costly maintenance and occasional failures. In the design of boiler under consideration there are no stays, the tubes are more effectively secured, and are not subjected to variation in temperature and stress at the points where they enter the drums.

A Train of Nebraska Poultry, Butter and Eggs Being Handled by the Chicago, Rock Island & Pacific for Chicago and New York

Rough Handling Not Always the Cause

Loading, containers and car springs are found to be responsible for considerable damage to lading

ROUGH handling, to which is attributed much damage to equipment and lading, is at present occupying the attention of individual carriers, the general managers associations of Chicago and New York, the Freight Claim Division of the A.R.A., and inspection bureaus, as well as other organizations connected with the railroad industry. The seriousness of rough handling can be judged not only by the claims paid, which in 1929 amounted to nearly $20,000,000 for rough handling and unlocated damage, but also by the damage to equipment, which is estimated to amount to three per cent of the total freight train car repair bill, or about $10,000,000. The extent of the damage to equipment is indicated in a study made by an eastern carrier which found that the cost of repairing the cars damaged by this cause amounted to about $517,600 for one year, while the damage to the lading in the cars roughly handled amounted to approximately $124,400. During that year visible damage to equipment, amounting to $126,520, occurred on 1,221 cars and 24 locomotives, while the invisible damage totaled $391,090. Side swiping resulted in damage averaging $108 per car, while coupling up at excessive speed, backing or running into other cars, insufficient rider protection and disregarding or misunderstanding signals, and the improper handling of brake valve caused a unit damage of $184. Brakes improperly applied from the rear caused a damage of $172 per car and backing off the end of the track or over the bumping post resulted in $47 damage to each car. In addition to this cost of repairing the damaged cars, it cost an average of $12 per unit or a total of $10,080 to operate the tool car.

A large variety of theories on rough handling exist among railroad men. Some maintain that improper loading rather than rough handling is responsible, but this is shown to be erroneous by the results of an analysis of rough handling based on the use of impact recording devices made by the Committee on Co-Ordination of Chicago Terminals of the General Managers Association. On April 26, 1929, this committee, of which V. W. Landon is secretary, began to place impact recording devices in cars handled in the Chicago territory to determine where and to what extent rough handling occurs. The tests have revealed some very interesting information.

Results of Impact Tests

At the beginning rough handling was frequent, but the tests have improved conditions as is indicated by the fact that impacts at 8 and 9 miles per hour have diminished appreciably and by the fact that while 64 test trips were made in June, 1929, with an average of 1.53 impacts at 6 miles per hour or over, a total of 177 test trips in March, 1930, averaged only 0.94 impacts.

The tests indicate that cars handled on Sundays and holidays are most apt to sustain heavy shocks. Cars equipped with spring gears sustain more so-called shocks of 5 mi. per hr. and over, and usually heavier shocks than cars equipped with friction gears. Cars, when handled in break-up and train yards, are more apt to sustain heavy shocks than when handled in industrial or house yards. During the summer months the number of impacts increased, probably because the oil on the car bearings had become thinner than during the winter months. The tests also show that many

The Result of Improper Stowing

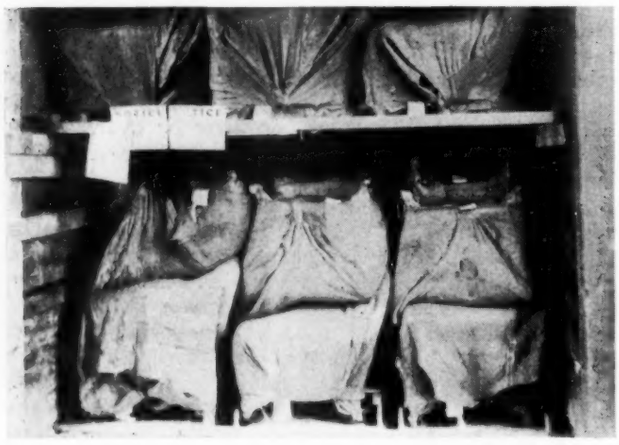
facts, such as the condition and types of gears, must be ascertained before it may be stated with reasonable certainty that a particular crew is handling cars roughly.

The tests have revealed other interesting facts. It was found that tracks in certain yards required realining and that day men are no more careful in the handling of cars than night men. While a large portion of the test cars handled in retarder-equipped yards show some impacts, the intensity of these impacts is usually 5 or 6 mi. per hr. and the number per yarding is noticeably smaller than in flat yards.

During September, 1930, a total of 1,188 yard and transfer train tests were made and 389 heavy impacts were recorded. Of the latter, 369 occurred in yards, 17 in trains and 3 were unchargeable. A total of 163 or 42.2 per cent of the total impacts were registered between 7 a.m. and 7 p.m. and 223 or 57.8 per cent between 7 p.m. and 7 a.m. Figures for the month also show that only 18.4 per cent of the impacts ranged between 8 and 12 mi. per hr. while 81.6 per cent were at 5.6 and 7 mi. per hr. The intensity and the number of impacts for September is as follows:

Intensity	No. of Impacts	Per Cent of Total
5 m.p.h.	176	45.6
6 m.p.h.	77	20.0
7 m.p.h.	62	16.0
8 m.p.h.	29	7.5
9 m.p.h.	19	4.9
10 m.p.h	10	2.6
11 m.p.h.	5	1.3
12 m.p.h.	8	2.1
	386	100.0

Another interesting disclosure in the tests is the fact that very little damage occurs to the lading in the cars. An examination of the records of 60 cars which received impacts as intense as 12 mi. per hr., showed only one case of damage to the contents. This consisted of a broken barrel stave in a car which received an impact of 2.5 mi. per hr.



A Furniture Loading Method Now Being Tested

Some Emphasize Loading

A large number of railroad men believe that improper loading is an important factor in rough handling and, as a result, have carefully studied this phase of the problem. An outstanding example of improper loading appears in shipments of tomatoes and grapes which are causing the carriers serious losses because of the condition in which the loads arrive at destination. It

The Car End was Forced Out When the Load Shifted While in Transit

is felt that the lengthwise loading of the lug boxes is the main cause of the damage for when the lug boxes are loaded lengthwise they offer the least resistance to collapse, nail pulling and breakage. To eliminate this damage it has been recommended that lug boxes be loaded crosswise. This recommendation is supported by a survey made by California lines to determine the relative amount of breakage in carloads of grapes packed in lug boxes and loaded lengthwise and crosswise.

These carriers, in conjunction with the Container Bureau of the A.R.A. and eastern lines, conducted a test on 1,068 cars of grapes and found that the breakage in cars loaded lengthwise was three times as great as in the cars loaded crosswise. In addition and contrary to popular belief, it was found that there is only

one degree difference in the temperature of the cars at destination.

The California lines are endeavoring to supervise the loading of cars and during the grape movement have an additional force of 30 men, under the jurisdiction of the Transcontinental Freight Bureau, who inspect cars while they are being loaded, and who check the containers to see that the shook is of the proper size and quality.

Another loading situation, over which the railroads have little control, involves shipments of furniture. A study of the damage to furniture reveals the necessity of proper loading, bracing and crating, but the cost prevents a correction of the situation since motor trucks can handle furniture by using pads instead of bracing and crates. The shipping of furniture by truck is not confined to short hauls, much being handled by truck between points as far removed as Chicago and Kansas City.

Containers

By changing the design of the containers which are responsible for a great portion of the claims charged to rough handling, a large amount of damage has been eliminated. Containers used for fresh fruit and vegetables present a difficult problem for economic conditions are such that the containers cannot be greatly strengthened. At the same time it is interesting to note that while much damage to fruits and vegetables is charged to frail containers, a large portion of the shipments involving frail containers are delivered with no claims or with claims of small amounts.

For many years the Pacific Coast, Southeastern and Southwestern carriers have been conducting investigations to determine the best class of containers and loading methods for transporting fresh fruits and vegetables. The committees in these territories, after many conferences with shippers, published tariffs and circulars containing requirements as to the sizes, dimensions and thickness of shook to be used in various containers.

That containers are an important factor in preventing damage charged to rough handling is evidenced in a recent shipment of canned good to the Atlantic and Pacific Tea Company at Chicago. Shipments were arriving at the rate of 500 carloads a week and about 50 per cent of the cars were damaged. Investigation showed that the thickness of the can had been decreased and that the box in which the cans were packed had not been strengthened. As a result neither the container nor the can was able to withstand shocks in transit.

Car Springs Blamed for Damage

This national study of rough handling has developed many angles, one of which is the significance of car springs. One packer is experimenting with truck springs in an effort to prevent meat being bounced off or torn from the hooks in meat cars. A railroad is endeavoring to find a car or truck spring that will protect a light load, while two Pacific Coast roads are experimenting with car springs in order to lessen damage to fresh fruit, melons and vegetables. Those who believe that part of the answer to the damage question will be found in a spring that will cushion a light load as well as a heavy load have much evidence to support their contentions.

A comparison of the tons per car of certain commodities with the damage they suffer indicates that the light weight commodities suffer the most damage. A list showing the tons per car of certain commodities, as taken from the Car Service Division reports, follows:

Automobile	6	Watermelons	13	Potatoes	18
Auto Trucks	8	Fresh Meat	13	Machinery	18
Furniture	8	Hogs	13	Sewer Pipe	18
Berries	9	Onions	14	Cereal Foods	19
Cantaloupes	11	Agricultural Impts.	14	Miscellaneous Mfg.	21
Eggs	11	Tractors	14	Canned Goods	23
Peaches	12	Lemons	15	Flour	24
Tomatoes	12	Grapes	15	Artificial Stone	30
Horses	12	Oranges	16	B. Tile	36
Cattle & Calves	12	Apples	16	Brick	37

By taking the total amount of unlocated damage, rough handling, improper loading and concealed damage and matching it against the car load revenue, the per cent of revenue represented by physical damage is as follows:

Sewer Pipe	7.5%	All carloads	0.4%	Glass and Glassware	2.6%
Fresh Fruits & Vegts	1.9%	Furniture	3.0%	Machinery	1.9%
Live Stock	1.5%	Eggs	1.9%	Merchandise	1.2%
Dry Goods & Clothing	1.0%	Beverages	1.2%	Newsprint	0.9%
Vegetable Oils	0.8%	Tobacco	0.9%	Butter & D. Prod.	0.7%
Sugar	0.6%	Brick & Stone	0.8%	Canned Goods	0.6%
		Agricultural Impts.	0.6%		

An outstanding example of the effect of "bouncing," or vibration of the car floor, on the loading appears in the experience of the Chicago, Indianapolis & Louisville, which railroad transports sawed and finished limestone into Chicago. The shipments consist of large blocks of finished and valuable stone, as well as slabs loaded on flat and gondola cars and although elaborate bracing is used, the stone frequently arrives at destination cracked. Following studies of the problem made by the shipper and the railroad, four flat cars and one gondola car were equipped with a type of friction bolster spring which acts as a snubber, and tests so far made on blocks of unfinished stone have demonstrated that the bolster springs dampen the periods of violent up and down vibration and minimize the damage.

As an indication of the importance of loading methods that enter into this problem, the American Railway Association has recently organized a national committee to be known as the joint A.R.A. Committee on Loading Rules, composed of a representative each from the Mechanical division, the Transportation division, the Car Service division and the Freight Claim division. This committee is charged with the duty of acting as a committee of direction for research and recommendation, and its function is to clear all loading rules for publication through whatever medium may be desirable.

* * *

Courtesy Canadian Pacific

H. M. King Prajadhipok of Siam in the Cab of Canadian Pacific Locomotive 5902, Which Hauled the Royal Special Train Out of Revelstroke, B. C., on the Mountain Section on the King's Eastward Trip Through Canada to the United States

British Roads In 1930 Depression

Sustained recession in business responsible for poor financial results which mark last year as one of the most disappointing in British railway history

By W. H. Fraser, M. Inst. T.,
Publicity Agent, Great Western Railway

THE year 1930 will go down as one of the most disappointing in the history of British railways. Bright prospects of a return to prosperity, seemingly evident at the close of 1929, were reflected also in the business of the first few weeks of 1930. From then on, however, and almost continuously, week by week throughout the year, revenues from all classes of service—passenger, freight, docks and ancillary business declined.

Thus at the close of 1930 the four group companies—the Great Western, the London & North Eastern, the London, Midland & Scottish and the Southern—reported a revenue decline of some £10,319,000 ($50,150,340) as compared with 1929 or £15,819,000 ($76,880,340) below the "standard" revenue that the railways are permitted by statute to earn.

The Industrial Depression

The root of the trouble was industrial depression which affected every industry in the country and particularly the heavy industries from which the railways derive the major part of their revenue. In the steel industry 76 furnaces were working in December, 1930, as compared with 162 in December, 1929. The depression in these and other industries was reflected in the general passenger and holiday traffic, as shown in Table I.

The number of passenger journeys, excluding those of season ticket holders, for the 11 months to November fell from 1,132,000,000 in 1929 to 1,116,000,000 in 1930, a decrease of 16,000,000.

Rate Increase Deemed Inadvisable

Although empowered to raise their rates, to do so at such a time was most undesirable, and the railways informed the Railway Rates Tribunal that "after a full consideration of the position, and having regard to the industrial and economic condition of the country, they were still doubtful whether a general increase of charges at the present time would result in any material improvement in their financial position."

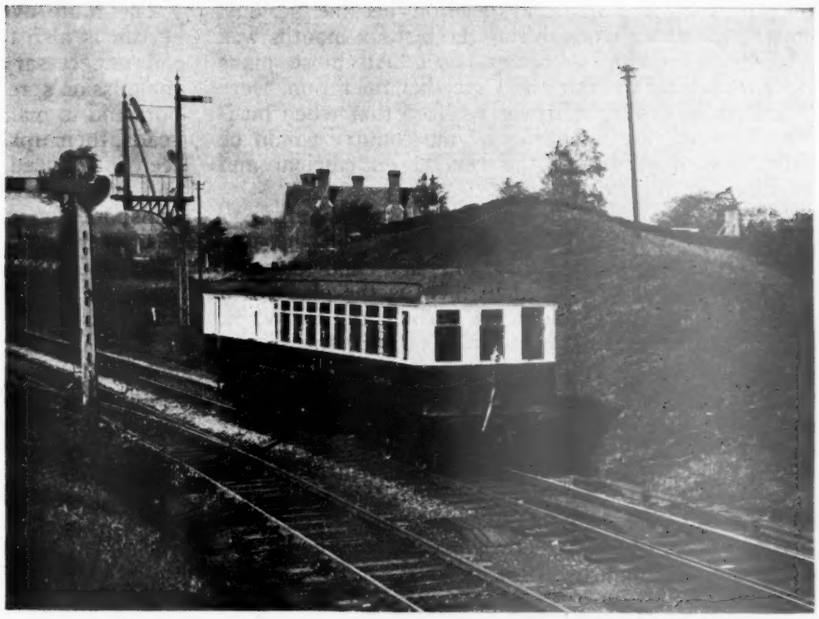
Table I.—Comparative Statement of Passenger and Freight Revenues, 1929-1930

Railway	Passenger revenue decrease compared with 1929	Freight revenue decrease compared with 1929	Total decrease compared with 1929
G. W.	$— 2,313,360	$— 4,860,000	$— 7,173,360
L. M. S.	— 7,673,940	—16,635,780	—24,309,720
L. N. E.	— 3,586,680	—12,057,660	—15,644,340
Southern	— 2,007,180	— 1,015,740	— 3,022,920
Total	$—15,581,160	$—34,569,180	$—50,150,340

As was only to be expected the continued decrease in revenue had a serious effect upon railway stocks and Table II clearly indicates the extent of the fall during the year.

Since the highest prices reached last year, there has been a drop in market value of over £46,000,000 ($223,560,000) in the ordinary stocks of the London

"The London, Midland & Scottish Has in Hand an Experiment with a Motor Vehicle Equipped for Use on Road or Rail, and Designed Principally for Freight or Passenger Service on Branch Lines"



"In the North, the Use of Steam Rail Cars Was Extended, and Running Costs Were Reduced, by This Means, 50 Per Cent per Mile Over Some 2,000,000 Miles Run by These Vehicles, as Compared with Trains"

Midland & Scottish and Great Western and the deferred stocks of the London & North Eastern and Southern.

Facing the Facts—Wages

At the close of the year the railways had to face the fact that, reviewed over a number of years, revenue still continued to decline; and although considerable economies had been effected, the chief item of expense was wages, which were 143 per cent (£67,000,000) above the pre-war level, while the increase in railway rates was only 50 to 60 per cent and cost of living only 55 per cent. In 1913 wages were 36 per cent of total railway receipts but in 1930 they represented 56 per cent. This despite the fact that there had been a decrease in employees from 702,000 in 1925 to 632,000 in 1930.

In May, 1930, the 2½ per cent voluntary reduction in wages (totaling some £3,000,000 in a year) accepted by all employees, was restored by agreement for a period of six months. In November the whole question of conditions of employment again came up for discussion. In view of their continued heavy losses the railways proposed an immediate reduction of six shillings per week (minimum weekly wage 38 shillings) for all wage workers and £10 to £15 reductions per annum for salaried employees. The proposal also embodied the abolition of the guaranteed week, payment to be made only for time worked, which could, if necessary, include Sunday and night duty for which no extra pay should be made, unless the hours worked were in excess of these hours. A saving of some £9,500,000 ($46,170,000) would thus accrue.

Table II.—Range of British Railway Stock Prices During 1930

	High	Low	Price on Dec. 31, 1930
G. W. R. Cons. Ord.	94	63¼	68
L. M. S. Ord.	57½	31	33
Southern Def. Ord.	32⅞	21¼	22½
L. N. E. Pfd. Ord.	39	15½	16½

In support of this claim it was shown that the railway industry was no longer a sheltered one but was subjected to fierce highway competition. Fresh capital was necessary from time to time for development and improvements and to attract such capital the railways must be in a position to pay a fair dividend. The amount available for distribution to shareholders had shrunk from 35 per cent to 19 per cent of the total receipts between 1913 and 1930. The men's unions strenuously opposed these proposals, and counterclaims, embodying, among other matters, a minimum adult wage of £3 ($14.58) a week and extra payment for Sunday duty, were placed before the National Wages Board. The report of this board, issued on March 5, provided for a general reduction of 2½ per cent in the wages of all employees, and for an additional 2½ per cent reduction for those in higher-salaried grades. (See *Railway Age*, March 21, page 602.)

Operating Economies

In their endeavor to curtail expenditures while meeting the requirements of traffic, the railways were able, owing to their co-operation with road transport concerns, to effect considerable economies. During the year a large number of unremunerative branch lines were closed altogether or for passenger traffic, and highway services operated by subsidiary companies substituted. Altogether 104 stations and stops were wholly or partially eliminated.

In the North the use of articulated steam rail cars was extended and operating costs reduced by this means from 22.7 pence (45.4 cents) to 11.3 pence per mile over some 2,000,000 miles run by these vehicles, as compared with auto-trains (locomotive and two coaches) previously used. This is being extended. Greater use was also made of locomotive power. The maximum work possible was obtained from engines by increasing the daily mileage per locomotive. Although there were no outstanding developments in the construction of locomotives during the year, advantage was taken of increasing the use of types of locomotives where the larger tractive effort avoided the necessity of duplicating trains at busy times. A saving in operating expenses resulted.

Developmental Plans

As the biggest industry in the country, the railways were requested by the government to undertake with certain assistance, development projects involving expenditures totaling £30,000,000 for the relief of unemployment. Many of these facilities were necessary steps in the direction of modernization, delayed by lack of capital, and it was hoped they would help to stimulate trade. Most of them were undertaken during the early part of the year when the fall in revenue was less acute, but in the closing months several large projects were

held up when the financial position became serious. Some maintenance work during the last six months was also deferred owing to heavy costs. All those plans which were vital to better and speedier operation, were carried on, however, as it was realized that when business improved, the industries of the country would be vitally dependent during the revival on efficient and economical transport.

These new plans included projects for dock improvements, terminal facilities and electrification, the provision of classification yards and new and enlarged passenger stations. Included in them is the plan for a partial rebuilding of Paddington station, the G. W. R. London terminus, at a cost of £1,000,000; the second stage of the Southern's dock extension project and provision of a big graving dock at Southampton; the construction of additional main tracks for two miles on the L. N. E.'s main East Coast line between Northallerton and York; and on the L. M. S. the electrification and multiple tracking of an important suburban section of the Southend line between Barking and Dagenham. Some 150 miles of track were laid with steel cross ties to help the steel industry.

Royal Commission on Transport

In 1930 the report of the Royal Commission on Transport was issued. This Commission was appointed by the government in August, 1928. In all, three reports were made, dealing with the methods of promoting the free and easy movement of road transport, the licensing of public service vehicles, the co-ordination of road passenger transport, and of all forms of transport whether by rail, road, canal or shipping.

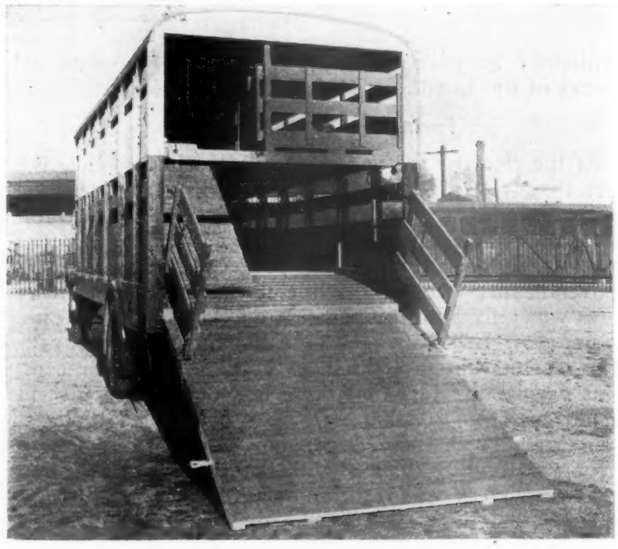
In its final report the Royal Commission paid a high tribute to the railways, and pointed out that the very high standard of operating efficiency attained has contributed more, perhaps, than any other single agency to the building up of trade; that the railways continue to occupy a pre-eminent position for comfort, speed and general efficiency in the handling of traffic.

They stated that "while we have thought it our duty to criticise railway management to some extent and to make certain suggestions for its improvement, we do not fail to recognize the great services railways have rendered and are rendering to the country. We are profoundly conscious of the importance of maintaining an efficient and prosperous railway system. . . . For many purposes—in fact for the main business of transport—they are indispensable, even though the newer forms of transport have, in some ways, modified the position they previously held. In addition to this, an immense proportion of capital is invested in the railways, and so long as they remain indispensable, the Nation cannot afford to place this capital on the scrap heap, or even to render it partially unremunerative. The aim should be to harmonize and co-ordinate the newer and the older forms of transport with the object of obtaining from each the maximum of advantage."

The feature of these reports, sections of which are now part of the new Road Act, from the railways' point of view, are the regulation of highway transport by the licensing of all public service vehicles, and the imposing of a speed limit of 30 m.p.h. on all passenger and freight road vehicles fitted with pneumatic tires, with lower limits for others according to weight and tire equipment. This will result in a drastic revision of schedules and the disappearance of many long distance highway services which previously had schedules greatly exceeding 40 m.p.h. The new act also restricts the hours of work of road employees.

The route over which highway freight services may be run is also to be regulated so as to avoid wasteful and unnecessary competition. Generally speaking the commission's report endeavors to regulate road transport and to make it pay its fair share of the cost of the roads, their upkeep and policing. Had these regulations been introduced ten years ago much wasteful competition would have been avoided and the effect of road transport competition on the railways would have been less severe.

In its final report the commission recommends an increase in taxes payable in respect of vehicles exceeding four tons in weight unladen, and a further substantial increase in taxes for each additional ton. For a heavy motor car of nine to ten tons unladen, the commission could see no reason why the license tax should not be as high as £120 ($583.20) per year. The tax to-day on such a vehicle is £60 (maximum). Further, that no heavy motor car unladen should be allowed to exceed 10 tons in weight, and that the maximum weight on any wheel should not exceed four tons. In making these recommendations the commission is very definitely of



"Livestock Traffic, Either in Connection with Rail Services or by Road Direct, is Also Undertaken, the Vehicles Used Being of the Double-Deck Type"

the opinion that it is not in the national interest to encourage further diversion of heavy goods traffic from the railways to the roads.

On the question of the future control of transport, four methods were suggested:

1. Nationalization.
2. Rationalization.
3. Combination of both.
4. Formation of a Public Trust.

As to which method was preferable the commission was unable to agree, but it observed that where anything of the kind had been attempted in Great Britain within recent years, the Public Trust system, not working for profit, but merely paying a fixed rate of interest on capital involved and devoting surplus funds to improvement of facilities, appeared usually to have been adopted.

Principal Events of 1930

The year saw many outstanding developments in operation. Luxury rail coaches proceeded a step further with the provision of bedrooms, improved parlor and

lounge cars. The use of third class sleeping cars was extended to a few excursion trains, dining car services increased, and the traveling public was catered to in every possible way. Another innovation was the introduction of first class excursion fares for specified trains and similar first and third class fares on Sundays. Throughout the year there was a general speeding of passenger services. On the cross-channel services new boats of the latest design and degree of comfort were brought into operation.

As to freight services, all the principal cities were connected by fast trains running at speeds of 40 m.p.h. and over, and giving next morning deliveries. The container system was considerably extended and the number in use rose from 3,357 in January to 4,355 in December, 1930, resulting in a noticeable return of traffic, especially that of a perishable nature, to the rail. The system of two or three color light signaling was further extended.

Electrified Mileage Increased

The mileage of electrified lines rose from 1,016 to 1,066. This was due to the big Southern project which added a further 50 miles of track to its already extensive suburban electrification system of 750 miles. Of special interest was the introduction of the "mechanical horse," a small tractor designed for the replacement of horse haulage, so as to involve no alteration or adaptation of highway vehicles previously drawn by horses. This is now being tested by the L. M. S., which company is also experimenting with a motor vehicle equipped for use on either road or rail. This is accomplished by means of a change over of wheels which requires less than five minutes. Almost any motor vehicle can be so adapted, and the vehicle can be attached to freight or passenger trains. It has been designed principally for use on branch lines.

Developments in Ireland

In Ireland further exhaustive tests were carried out with the Drumm electric storage battery, on which the Irish Free State government has or will have spent large sums in the last two years. It is claimed that this battery gives all the advantages of third rail electrification without the enormous cost of such installation, and can be charged in from 8 to 60 minutes. In practice it has shown that a train can accelerate at the rate of one mile per hour per second, and it is anticipated that further experiments will demonstrate that speeds of from 50 to 60 m.p.h. can be maintained with a load of 400 tons.

Another experiment of a different nature was the conversion of nearly 2,000 miles of the Great Southern of Ireland from double to single track. This experiment is being closely watched as it is likely to be the forerunner of similar revolutionary procedures throughout the railway world. While it leads to considerable economies in capital expenditure, maintenance and operation, train movements are not in any way adversely affected, but on the contrary facilities for handling traffic are increased. At each station some 500 yards of disused double line has been retained to form the passing and lay-by sidings where slow passenger or freight trains are switched to permit the passing of fast or "non-stop" trains.

Rail-Road Co-operation

Considerable progress was made in the co-ordination of rail and highway services during the year, and at its close the railways had reached agreements with practically every large private and municipal highway-operating company in their territory. The railways have now some £10,000,000 of capital invested in highway services and a direct interest in some 8,000 motor coaches. They are now in a position to offer the public a better transport service which includes: The interavailability of rail and highway tickets in many areas; arrangements of services to facilitate the exchange of passengers between rail and road services; combination of railway and motor coach timetables; adjustment of services when possible to improve connections; employment of motor coach transport as extensions of railway journeys for pleasure and other purposes; amplification of travel facilities by use of both forms of transport in combined tours.

Freight Services

On the freight side the railways continued to extend their own highway services. Country lorry services operating in a 12-mile area about railheads were considerably augmented. These provide the vital link between manufacturers or grower and consumer, and are being relied on more and more, especially by farmers whose whole cartage arrangements are now undertaken. Of considerable interest is the experiment with a system of "regionally controlled" road services. The whole of the cartage arrangement in this area, controlled from one central office, is performed economically and efficiently by a fleet of only 20 cars, and rush traffic at any point can thus be handled immediately. Collection and delivery services were also expanded as a result of the extension of the radius of the free delivery areas for collection and delivery traffic. An experiment is also being tried of concentrating such traffic upon one main station serving a considerable area, which has resulted in traffic being expedited and economies in operation. The railways are also prepared to quote for cartage of low class traffic, consigned by rail, at "station to station" rates, or for rail-highway movement or highway services throughout for the conveyance of general building materials, bricks, pipes, girder work, timber and roadstone required for delivery to site.

The movement of livestock to and from markets and shows either in connection with rail services or by highway direct is also undertaken. This is the result of a growing demand by farmers for such conveyance, as not only do cattle arrive in better condition, but owing to the congestion of the roads, it is becoming increasingly difficult to walk cattle any distance. The vehicles used for this purpose are of the double decker type which can be converted into single-deckers, if required. Conveyance of race horses by road was also undertaken.

Air Powers

Air powers were obtained in 1929 by the railways. Up to now there has been no demand, from a railway point of view, for this form of transport, but the possible development of co-ordinated rail and air services for passenger, freight and mail traffic, is receiving the closest attention of the railways, who have carried out some preliminary work.

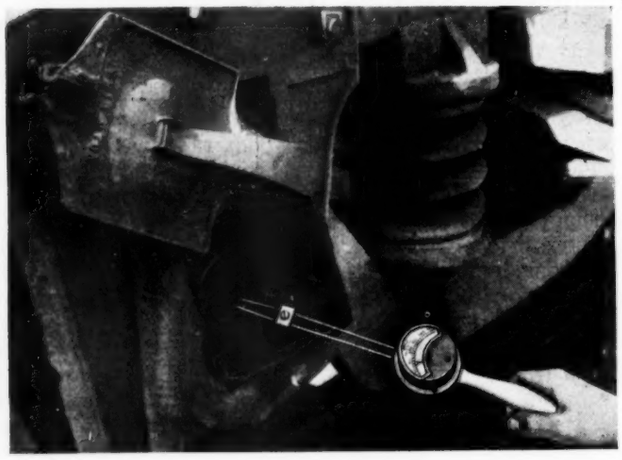
Public Interest in the Railways

One of the most pleasing features of the year was the continued public interest in the railways. Their value to the nation was realized as never before both by the press and public alike. Whatever attitude may have been adopted when they had a monopoly, to-day the policy is to please the public and to cater to it in the light of changing needs.

Hot Bearing Indicator

A PORTABLE indicating pyrometer, recently developed and placed on the market by Illinois Testing Laboratories, Inc., Chicago, is now being used in detecting hot bearings on locomotives and rolling stock, as well as for a number of other purposes in railway service.

This instrument, called the Pyro Prod, consists of a highly sensitive yet rugged millivoltmeter, to which is attached a pair of pointed thermocouple wires. When the points of these wires are pressed against the bearing,



Convenient and Accurate Indicating Pyrometer Used to Show the Temperatures of a Hot Journal Bearing

the bearing metal completes the circuit and this causes a small flow of electric current to the indicator. This flow of current increases with the increase of temperature and causes the point of the millivoltmeter to deflect over a scale which is graduated in degrees Fahrenheit. Almost instant readings are obtainable, as it is merely necessary to make contacts between the pointed thermocouple wires.

The Pyro Prod can be furnished in several different temperature ranges, but the one most generally used for bearing work is from 0 to 600 deg. F. When desired, the Pyro Prod is furnished with an automatic internal cold-end compensator. This is important where the instrument is to be used out-of-doors and subject to wide changes of atmospheric temperature. Other models of contact-type pyrometers can also be furnished for measuring the surface temperature of other metals such as heated billets, rods and rails.

When used on locomotives, the Pyro Prod is carried in the cab and at each stop the engineman takes the instrument and goes from one bearing of the locomotive and tender to another, quickly checking the temperatures, and eliminating all guesswork as to whether or not excessive temperatures are being developed, with consequent possibility of train delay. The instrument has also been used in connection with the heat treating of rail ends after application to the track by heating with an oxyacetylene torch and subsequently quenching from the correct surface temperature as determined by the Pyro Prod.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY has contracted with the Mountain Ice Company, a subsidiary of the City Ice & Fuel Company, to take the entire output (175 tons a day) of a plant to be constructed at Leeds, Mo.

Penna. Will Seek Authority To Transport Truck Bodies

(*Continued from page 864*)

"This country does not need subsidized transportation and it should be discontinued. If it is the policy to build these waterways, then the railroads should be free to use them upon the same terms as any other individual or corporation. In particular, they should be permitted to try their hand at operating the barge lines if, in the opinion of railroad managements, there is any prospect of placing them upon a sound financial basis. In view of our abundant transportation facilities of other kinds, the waterway policy, especially with respect to many contemplated further expenditures, is of course open to the most serious doubt."

He spoke hopefully of the possibility of reaching an agreement with the oil industry with regard to competition between pipe lines and the railways. "As a matter of fact," he continued "conferences have been arranged between leaders in the oil industry and some of the executives of leading railroads to talk over with them the bearing of pipe lines upon the transportation of oil and gasoline, with the view to working out a program helpful and advantageous to both sides. Arrangements are also being made for a series of conferences with leading truck manufacturers so that the officers of the railroads may discuss with them, on grounds of mutual interest, the problems of highway transport as related to the rail carriers.

"Very regrettably there has been a tendency in some quarters to go beyond the railways' 'Declaration of Policy' and read into it other meanings which I am sure were not intended, and do not represent the attitude of the railroads. A particularly unhappy example was the currency given to the intimation that the railroads, having been 'ham-strung' themselves for many years, were now seeking to 'ham-string' and cripple their competitors. I can authoritatively say that that is not the attitude of the Pennsylvania Railroad management, nor is it that of the many officers of other railroads whom I know, and with whose views I am familiar.

"Allow me to point out an interesting anomaly. Federal regulation of transportation is based on the Commerce Clause of the Constitution adopted in 1787. At that time the only means of inland transportation in existence were on highways and waterways. Yet, today, highway and waterway transportation are unregulated by federal power, while the railroads, which had not even been heard of in 1787, are the most regulated."

* * *

Looking North over Sixty-Third Street Station, Chicago, on the Electrified Section of the Illinois Central—I. C. Divisional Office Building at Left

Communications and Books . . .

Graduated Rates

CYNWYD, PA.

TO THE EDITOR:

Most of the electric companies now have graduated rates for their consumers which appeal to all as the fairest method of assessing charges. Why cannot this method be applied to railroad passenger fares? In other words, if a person were going to take a 1000-mile trip the price of his ticket would be figured as follows:

First 200 miles at 3c per mile	$ 6.00
Next 400 miles at 2½c per mile	10.00
Last 400 miles at 2c per mile	8.00
	$24.00

This would compare with $36, the present price of such a trip at standard rates. The idea of the larger or higher rate for the first 200 miles is to cover the overhead charges. Once these are paid for, the cost of hauling passengers is small. The public is not as unintelligent as the movie magnates seem to believe, and the utilities by skilfully grading their rates and explaining why they do so have gained the confidence of the people, and caused them to use their facilities to an increasing extent to the mutual profit of both. Cannot the railroads apply the same methods? People today travel over 50 miles in buses not usually because they like them but because they have to go and the buses are cheaper. Let the railroads meet the bus rates and meet them in a way to make people realize that they are traveling at a low rate per mile.

CHARLES F. FORSTALL.

New Books

Soviet Foreign Trade, Menace or Promise, by J. M. Budish and Samuel S. Shipman. 276 pages, 7½ in. by 5 in. Bound in cloth. Published by Horace Liveright, Inc., New York City. Price $2.50.

Why Recognize Russia?, by Louis Fischer. 298 pages, 7½ in. by 5 in. Bound in cloth. Published by Jonathan Cape & Harrison Smith, Inc., New York City. Price $2.

Russia has of late become the inspiration for a vast and varied amount of literature on the economic and political philosophy of its Soviet government. This Soviet regime has been alternately denounced and defended in interpretative newspaper and magazine articles, books, "news releases" and what not. Such discussions have become of more than passing interest to American railwaymen because of the work of Ralph Budd, president of the Great Northern, in his recently-completed survey of Soviet railways and the subsequent employment of Charles A. Gill, superintendent of motive power of the Baltimore & Ohio, with an American staff to supervise the modernization of all steam railways in Russia. Also, because of this modernization program, the Soviet market looms as a possible source of export business for American manufacturers of railway equipment and supplies. Here are two of the recent books on the experiment; they are moderate in tone as they frame their separate pleas for a dispassionate and realistic view of the Soviet place in world economy.

The authors of "Soviet Foreign Trade, Menace or Promise" are associated with the economic division of the Amtorg Trading Corporation, the commercial agency of the Soviet government in the United States, and the stated purpose of their work is "to give a rounded picture of Soviet foreign trade, and particularly its trade with the United States, on the basis of essential and pertinent facts." They ridicule the idea that Soviet exports constitute a menace to capitalistic nations since "the domestic market of the Soviet Union is practically unlimited and the problem of an undisposable surplus making necessary forced exports is non-existent." The book includes many statistical tables designed to show that nations dealing with the Soviet benefit greatly from such commercial intercourse. In citing pending Soviet plans of industrial expansion the authors find among other trade possibilities that a great field of development is presented by the transportation system of the Soviet Union. The revised program calls for the completion of 14,000 miles of new railways within the present five-year period. "And this is only a modest beginning," the book continues to say, "for a much larger program to be inaugurated upon the conclusion of the present five-year period. A great deal of railway equipment, including machinery and equipment for the production of automatic couplings, air brakes, signaling systems, as well as a substantial part of locomotives, rolling stock, etc., will in all probability be imported from foreign countries." This international division of labor between the Soviet national economy and that of advanced industrial countries, it is asserted, "will, according to all indications, operate for many years to come approximately on the same basis as at present." In short it is held that "the dominating purpose of Soviet foreign trade is to secure the imports of producers' goods necessary for accelerating the socialist construction of the national economy. The imports of consumption goods which cannot be produced to advantage within the country are dependent, therefore, upon whatever resources are available after the imports of machinery and equipment have been provided for."

In "Why Recognize Russia?" Mr Fischer presents a forum discussion of this problem which has been a pressing one in the United States for more than a decade. From an introductory chapter on the Soviets in world affairs the author proceeds to a review of contacts between the government of the United States and the Soviet up to the sharp retort of Litvinov to the Stimson note invoking the Kellogg Pact in the recent Soviet-Chinese conflict over the Chinese Eastern Railway. Then come the arguments for and against recognition and a chapter on the problem of debts. While, in closing, the author makes no plea for recognition he insists that so big and vital an issue as the Russian issue cannot be ignored and must be handled realistically.

Centennial History of South Carolina Railroad, by Samuel Melanchthon Derrick. 335 pages 9¼ in. by 6 in. Illustrated. Published by the State Company, Columbia, S. C.

Here in vividly interesting style is told the story of the pioneer railroad of the South from the time it was originally chartered in 1827 as "The South Carolina Canal and Rail Road Company" until 1902 when, as "The South Carolina and Georgia Railroad Company" it was merged into the Southern Railway System. The South Carolina was organized and promoted by Charleston merchants for the prime purpose of reviving business in that city. When completed between Charleston and Hamburg it was the longest railroad in the world and the author finds "excellent reasons for believing that the South Carolina road was the first ever constructed in this country with a definite plan of operating it exclusively by locomotive power." In any event, he says, "it is certain that the 'Best Friend' was the first successful locomotive built in America."

But with the Hamburg line completed, Charlestonians, ambitious still, envisioned rail connections with the grain-growing, stock-raising regions beyond the mountains. Thus there was formed, in 1836, The Louisville, Cincinnati and Charleston Rail Road Company. This project was abandoned and the company merged with the South Carolina which latter proceeded to complete several branch lines; it stimulated trade and earned a modest dividend until the time of the Civil War when "the breakdown of the Confederacy and the invasion of Sherman's Army brought disaster to the railroad." There followed several reorganizations until the coming of the Southern brought, after sixty-three years, the realization of the dream to connect Charleston with the West.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Interstate Movement of Electric Energy. Letter from the Chairman of the Federal Trade Commission transmitting in response to Senate Resolution No. 151, the final report ... on the quantity of electric energy transmitted by any means from the state in which it is generated into any other state. Includes also four interim reports. Senate Document No. 238, 71st Cong., 3d sess. 134 p. Map. Pub. by U. S. Govt. Print. Off., Washington, D. C. 20 cents.

My Experiences in the World War, by John J. Pershing. See Index under "Railroads" and "Railway." 2 Vols. Illustrated. Pub. by Frederick A. Stokes & Co., New York City. $10.

New England—1930, by Edward S. French. The President of the Boston & Maine reviews past history, present conditions, and possibilities for the future, in this article which appeared in the Harvard Business School Alumni Bulletin for April 1, 1931. 7 p. Pub. by Boston & Maine Railroad, Boston, Mass. *Apply.*

Regulation of the Contract Motor Carrier Under the Constitution, by LaRue Brown and Stuart N. Scott. Reprinted from Harvard Law Review, v, 44, no. 4. pp. 530-571. Distributed by Motor Truck Committee, National Automobile Chamber of Commerce, New York City. *Apply.*

Periodical Articles

Beatified Railwayman. "The first railway worker in history to be canonized as a saint was the subject of preliminary ceremonies toward beatification at Vatican City last week....." [Paolo Pio Perazzo of the Italian Railways]. Time, March 23, 1931, p. 28, 30.

A Coronation in Abyssinia, by Ellen N. LaMotte. Includes description of the equipment and service on the line from Djibouti to Addis-Abéba. "It was a special train because of the diplomats and was to make the journey in 36 hours [500 miles]. Usually these trains do not run at night... This is because the natives like to tear up the rails to make spear heads. . . The trains run only twice a week . . . " p. 574, 584. Harper's, April, 1931, p. 574-584.

Du Passé à L'Avenir des Transports en Russie, by A. de Goulévitch. Brief history of rivers, ports, and railroads in Russia in relation to the economic development of the country. Revue Politique et Parlementaire, April 10, 1931, p. 64-77.

Investing Twenty Millions A Week, by Ernest Hamlin Abbott. "Each week six committees of four great life-insurance companies in the city of New York invest on an average approximately twenty million dollars..." p. 29. Table on p. 29 shows that 17 per cent of total investments are in railroad bonds and stocks. World's Work, May 1931, p. 28-30.

The New Rail Valuation Ruling, by Oliver B. Lerch. "Setting a Precedent"—the Interstate Commerce Commission's decision in the R. F. & P. recapture case. Barron's, April 27, 1931, p. 8.

Signals Replace Train Orders, by R. D. Moore. "An interesting innovation in train dispatching, by which telegraph orders are discontinued and the use of train orders entirely abolished, has been made by the Southern Pacific Company on its Stockton Division in California." p. 332. Illustrated. Scientific American, May, 1931, p. 332-333.

Stagecoach, by Wesley Stout. Pre-railroad high lights in Western history. "Not the Cumberland or Mohawk Trail, the Boston or Albany post road, the Lancaster or Shenandoah pike. the Natchez Trace or the Santa Fé Trail was the nation's greatest land path, but this stretch of highway from Carson City to Placerville and Sacramento by way of Johnston's Pass and the American River Canyon—greatest in traffic, in historical import, in tolls collected and in engineering." p. 18. Saturday Evening Post, April 25, 1931, p. 18-19, 149-153.

Thirty-three "Rail" Sons in Five Families, by Glen Perrins and H. L. Childs. "Railroading runs in some families. . . " Railroad Man's Magazine, April, 1931, p. 95-98.

Looking Backward . . .

Fifty Years Ago

A syndicate has negotiated a contract with the Newfoundland authorities for the construction of a railroad from St. John's, Newfoundland, south to the copper mines at Hall's Bay, about 300 miles. The estimated cost is $6,000,000 and the road is guaranteed to be completed in three years.—*Railroad Gazette,* April 29, 1881.

The strike of freight handlers at Chicago was terminated on May 1 by the acceptance by the men of an increase of from 15 to 20 per cent in wages accorded by the companies. Before the strike had ceased the switchmen employed in the yards of the various roads united in a demand for an increase to $3 per day for switchmen and $2.75 for helpers. They walked out on May 2, except on part of the Chicago & North Western which paid the highest rates in the Chicago district.—*Railway Age,* May 5, 1881.

Twenty-Five Years Ago

W. H. Kirkbride, heretofore roadmaster on the Southern Pacific at Red Bluff, Cal., has been appointed assistant resident engineer at Sacramento, Cal.—*Railway Age,* May 4, 1906.

W. G. Bierd, heretofore superintendent of the Panama Railroad, has been appointed general manager, with headquarters at Colon, Panama.—*Railway and Engineering Review,* May 5, 1906.

The extension which is being built by the Southern Pacific from Guaymas, the southern terminus of the Sonora Railway, south along the east coast of the Gulf of California to Guadalajara, 775 miles, will be an important factor in the development of that portion of the Republic of Mexico lying between the Sierre Madre mountains and the coast. The work is already well advanced on the first division from Guaymas to Alamos, 168 miles.—*Railway Age,* May 4, 1906.

Ten Years Ago

Edward S. Jouett, assistant general counsel of the Louisville & Nashville, has been elected vice-president and general counsel, with headquarters at Louisville, Ky.—*Railway Age,* April 29, 1921.

The House of Commons of Canada has passed a bill introduced by the Canadian government to take over and operate the Grand Trunk [now part of the Canadian National]. Under the terms of the measure, the system, including the lines in the United States controlled by the company, will be placed under government operation without waiting for the result of the arbitration proceedings now under way to determine the value of the property.—*Railway Review,* April 30, 1921.

President Harding and the members of his cabinet are finding the railroad problem one of great difficulty and many complications. Recent cabinet meetings have been very largely devoted to the economic situation, with particular reference to agriculture, industry and transportation, and the President and his advisers appear to have been persuaded that the railroad question is the key to the whole problem, but they have as yet found no "plan" or "solution." The problem, from the viewpoint of Washington officials, is how to reduce rates in view of the position taken by the railroads and the Interstate Commerce Commission that there can be no general reduction in rates until the foundation has been laid for a reduction in operating costs.—*Railway Age,* April 29, 1921.

Odds and Ends . . .

A Million Passenger Trains

Joe Banks, redcap at the St. Louis Union station, who in his 16 years of baggage toting estimates that he has met 1,113,000 passenger trains, had never until recently ridden on a railroad. He broke this record when he made a round trip to Jefferson City, Mo., over the Missouri Pacific.

Golf Bags Now Regular Baggage

Golfers who have been complaining of the high cost of transporting their golf bags and clubs about the country may now drop their complaint. In the past few months, several railways have declared that golf bags are now a part of regular baggage, and more railways are coming around to this view every day.

Fifty-Six Times Around the World

The Southern Pacific has discovered what it believes to be the long-distance record for commuting on its system. N. L. Spinetti of San Jose, Cal., began commuting the 47 miles between that city and San Francisco in 1882, and in the 48 years intervening he has not missed a single working day and has amassed a mileage of 1,346,236 miles.

A Vanishing Occupation

The horse and wagon is a fast disappearing adjunct of American railways. Of the 160,000 odd employees of the Pennsylvania only three, according to a recent count, are classified as "teamsters and stablemen." And that, incidentally, is the smallest group of employees on the Pennsylvania. The largest group is composed of enginemen, firemen, and trainmen, who number more than 32,000.

"Chief Iron Horse"

The Saskatchewan Indians have commissioned B. T. Chappell, general superintendent of the British Columbia district of the Canadian National, as a full-fledged chief of their tribe. At a tribal ceremony they christened him "Chief Iron Horse" and presented him with a buckskin jacket and a headdress. Incidentally, Mr. Chappell was born on Prince Edward Island. His territory now includes the Canadian National branch on Vancouver Island nearly 4,000 miles away from his place of birth, at the extreme opposite edge of Canada.

Peanuts, Popcorn, and Chewing Gum

Once again the Interstate Commerce Commission comes forward as a dietician. This time it holds that salted peanuts are not a food and are therefore not entitled to shipment as third class freight. The commission admitted that the peanut is a "leguminous vegetable containing substantial elements of protein, fats, and carbohydrates," but said that salted peanuts compete with five-cent bags of parched peanuts at ball games and circuses. The examiner who wrote the report has evidently determined at first hand the doubtfulness of classifying edibles that compete with "parched" peanuts at baseball games as food.

This Is News

When a dozen cases of eggs come out of a railroad wreck, along with other miscellaneous l.c.l. items, resembling nothing so much as an uncooked omelet, that is not news. But when two cars, each loaded to the roof with 600 cases of eggs, take part in a collision, roll down an embankment and the consignee presents a claim for only $4.15, that is news. The eastern carrier that experienced this surprise should claim an egg-handling record. After the accident one car came to rest on its side and the other on its roof. They were hoisted from these positions, set on their trucks and delivered direct to the consignee in New York. A wedge-type bulkhead expanded the loads so that they fitted tightly within the box cars.

Cure for Insomnia

Somebody * * * ought to write an article about advertising cycles. Three or four years ago failure seemed to be the result of non-smoking of cigarettes; now it seems that anybody who doesn't put in his nights on this or that railroad is headed straight for insomnia.— F. P. A. in the New York Herald-Tribune.

A Veteran of the Cherokee Strip

Al McDonald, engineman on the Golden State Limited of the Chicago, Rock Island & Pacific, in and out of Dalhart, Tex., was an eye witness to the opening of the Cherokee strip in Oklahoma, a land rush that holds a unique place in American history. Mr. McDonald stood on the Kansas-Oklahoma line near Caldwell, Kan., at noon on September 16, 1892, when prospective settlers, afoot, on horseback and in wagons and buggies, began their mad rush to stake their claims. The Rock Island took part in the rush, for in 1892, its line south from Herington, Kan., extended to Minco, I. T. As the signal for the rush was given a Rock Island train of 16 stock cars started across the line. The train moved at a speed of about 6 miles per hour and the land hungry who swarmed over the tops and sides, as well as the insides, of the cars dropped off to stake their claims along the route.

A Florida Railroader Broadcaster

Since our mention several weeks ago of C. H. Swanson, Louisville & Nashville train dispatcher, as one of the few railroaders operating a broadcasting station, we have been informed of others in practically every section of the United States. The latest is Albert H. Davis, accountant in the office of the superintendent of the Ridge district of the Atlantic Coast Line at Lakeland, Fla. Mrs. Annie G. Hull, reporter for the Atlantic Coast Line News, states that Mr. Davis holds the rank of chief radioman in the United States Naval Communications Reserve. He operates a 150-watt short-wave transmitting station, call letters W4GQ, through which, since January 1, he has been in communication with England, France, Spain, Germany, Africa, South America, Australia, New Zealand, Hawaii, and Honk Kong, China, as well as all portions of the United States, Canada, Mexico, and Central America.

Phonetic Railroading

PHILADELPHIA, PA.

TO THE EDITOR:

The page in the *Railway Age* assigned to "Odds and Ends" is of such interest, by way of momentary refreshment from more serious topics, that all who can should make at least a small contribution to it; on reading Mr. Appleton's tale about Pennsylvania Dutch dialect in the issue of April 11, I was reminded of the following incident:

In the early days of the Reading, and shortly after that company acquired the Catasauqua & Fogelsville Railroad, part of the acquisition consisted of several passenger coaches on which were stenciled the letters "C & F." One morning a passenger asked a brakeman, who was a native of Kutztown nearby, but more or less "green" in railroad experience, the meaning of the letters "C & F" which appeared over the door of the coach in which they were riding. The brakeman, not wishing to appear ignorant thoughtfully scratched his head and replied, "Cutztown and Filladelfy." Phonetically the answer seemed to satisfy the passenger.

J. T. BOUGHER,
Car Accountant, Reading.

NEWS

Commission Gathers Data on Bridge Companies

The Interstate Commerce Commission in three recent hearings gathered information concerning the ownership and operation of bridge companies as they are affected by certain sections of the Transportation Act. The hearings were occasioned by an application of the Keokuk & Hamilton Bridge Company to the commission asking it to rule that the bridge company's excess earnings were not subject to the recapture provision of the Transportation Act. The commission's decision has been withheld pending a study of the data gathered at the hearings.

Fifteen bridge companies, representative of all the bridge companies in the United States, were cited to appear before the commission's representative at Washington, Chicago or St. Louis.

Representatives of the Keokuk & Hamilton Bridge Co., the Covington & Cincinnati Elevated Railroad & Bridge & Transfer Co., and the Wilmington Bridge Company appeared at the hearing at Washington on April 20. At Chicago, representatives of the Sault Ste. Marie Bridge Company, the Leavenworth Terminal Railway & Bridge Co., the Winona Bridge Railway Company, the Dunleith & Dubuque Bridge Co., the Sioux City Bridge Company and the Louisville & Jeffersonville Bridge & Railroad Co. were present. Witnesses at the hearing at St. Louis on April 24 were representatives of the Shreveport Bridge & Terminal Co., the Arkansas & Memphis Railway Bridge & Terminal Co., the Kentucky & Indiana Terminal Railroad Co., the Missouri & Illinois Bridge & Belt Railroad Co., and the Southern Illinois & Missouri Bridge Co. Briefs in each of these cases may be submitted to the commission by May 15.

No Rate Reductions in Canada

Declaring that "the railways would certainly be embarrassed if at this time they were asked to give special consideration in the way of passenger or freight rates" Hon. Robert J. Manion, Minister of Railways, speaking in the House of Commons at Ottawa last week declared against such a policy, this being the government's attitude toward clamors for reduced passenger and freight rates. The discussion centered upon a resolution introduced by Oscar Boulganer, a Quebec Liberal, his resolution calling for re-establishment of reduced passenger rates in favor of colonists and for grants of public money to enable the railways to make these rate reductions. After a debate of an hour the resolution was withdrawn. Robert Gardiner, Progressive leader in the House, also declared against asking the railways to reduce rates in favor of land settlement at this time.

Employees Appeal for Patronage

Employees of the Baltimore & Ohio and the Cleveland, Cincinnati, Chicago & St. Louis at Sherwood, Ohio, on April 7 addressed an appeal to the public and business men of that city to patronize the railroads in preference to motor coach and truck lines. The appeal was sent out in the form of a printed letter signed by the 24 employees of the Baltimore & Ohio and the Cincinnati Northern, (Big Four) who are residents of Sherwood. The appeal was as follows:

"We, the employees of the B. & O. and the Big Four, do respectfully show that:

"1. We are residents of Sherwood, Ohio, and spend the wages we earn with the merchants of Sherwood, Ohio, and invest our gains in Sherwood property.

"2. The B. & O., the C. C. C. & St. L., and the Wabash paid into the treasury of Defiance county, Ohio, the following amounts in taxes. For the year 1930:

B. & O	$78,309.94
Wabash	12,251.90
C. N.	9,941.30

making a total of $100,503.14. What industry pays more taxes in Defiance county than the railroads?

"3. What industry in our community has a payroll to compare with the railroads? The payroll of the B. & O. and C. N. in Sherwood in 1929 was close to $40,000. How much do your bus and truck lines pay in salaries in Sherwood? How many Sherwood residents are given employment by these bus and truck lines?

"4. The payroll of the B. & O. and C. N. was considerably lowered in 1930 as a result of the encroachments of bus and truck competition which resulted in a corresponding lessening of the buying power of their employees, and also in a five-day week for some employees.

"5. We railroad employees urge our merchants and townfolk to patronize the railroads in preference to the truck lines so that the railroads may be able to keep up the present payroll and if possible to increase it, and that they may be able to pay into the treasury of our county these large amounts in taxes for the support of our government.

"6. We also urge our home people to patronize our home stores and industries.

"7. When you order a bill of goods, please request that it be shipped by rail."

Railroads Seek Injunction Against Reduction of Grain Rates

The Western railroads, including 72 individual companies, filed a petition in the United States District Court at Chicago on April 29 to enjoin the enforcement by the Interstate Commerce Commission of its order reducing rates on grain and grain products in the Western district, which becomes effective on June 1. The petition pointed out the fact that revenue from grain and its products represented 12.1 per cent of the total revenue of the carriers in the Western district in 1924. The effect of the order, the petition said, is to materially reduce the general level of rates in the Western district. It is estimated that the order approximates an average reduction of 13 per cent in grain rates and will result in a $20,000,000 reduction in gross revenue and net railway operating income of the carriers.

The railroads anticipate that the order, if placed in effect, would cause the greatest reductions in rates in the far West and in the Southwest. The order of the commission is known as No. 17,000—Rate Structure Investigation, an inquiry which was instituted on March 12, 1925, into grain rates within the Western district and for export.

National Safety Council Awards

The Bronze plaques awarded to the 1930 winners of the annual steam railroad accident prevention contest conducted by the National Safety Council will be given out at a dinner to be held at the Stevens Hotel, Chicago, on May 19. The winners of the awards, which are made for the greatest reductions in casualty rates (killed and injured) among employees on duty, and the casualty rates, are as follows:

Group A, Chicago & North Western, 2.69; Group B, Atlantic Coast Line, 1.66; Group C, Oregon Short Line, 2.63; Group D, Mobile & Ohio, 2.7; Group E, Duluth, Missabe & Northern, 2.63; Group F, Staten Island Rapid Transit, 2.96, and Group G, Missouri-Illinois, 2.21.

A new classification added this year for switching and terminal units shows the following winners:

Group A, Baltimore & Ohio Chicago Terminal, 2.54 and Group B, Lake Terminal, 0.00 (no casualties during the year). In the Pullman group, the Detroit zone won first honors with a rate of 1.55. Several roads, although ineligible for awards, having won first honors in their respective groups for a two-year period, kept up their records. These are the Union Pacific System in Group A, the

Continued on Next Left Hand Page

SUPER-POWER Steam Locomotives

■ Locomotive size is limited by permissible wheel loads on existing track and structures.

■ Instead of expending capital for strengthening track and bridges to accommodate heavier driving wheel loads, the same results can be secured by getting more work out of the driving wheel loads permitted by existing structures.

■ For a given weight on drivers Super-Power Locomotives produce *Maximum* Gross Ton Miles per Hour with *Minimum* Fuel Consumption.

RESULT . . . Lower Operating Costs

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS

Incorporated

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Oregon-Washington Railroad & Navigation Company in Group C, the Los Angeles & Salt Lake in Group D, and the Gulf, Mobile & Northern in Group E. The Committee on Awards for the 1930 contest consisted of C. W. Bergquist, president of the National Safety Council, chairman; Dr. M. O. Lorenz, director of the Bureau of Statistics of the Interstate Commerce Commission, and Lew R. Palmer of the Equitable Life Assurance Society of New York.

I. C. Cuts Freight Train Time

The Illinois Central has cut 6 hr. 45 min. from the southbound and 2 hr. from the northbound schedule of its manifest freight train between Chicago and New Orleans, La., thus placing the train on a 48 hr. 15 min. schedule southbound and a 50-hr. schedule northbound.

I. C. C. Postpones Date of Joint Rail-Barge Rate Order

The Interstate Commerce Commission has postponed to August 24 the effective date of its order of April 8, 1929, in Ex Parte No. 96, in which it required the establishment of through routes and joint rates via the federal barge line and connecting railway lines.

Fined for Illegal Freight Rates

In the United States District Court at Baltimore, Md., on April 27, a fine of $6000 was imposed on the Baltimore & Ohio for granting rebates on shipments of whiting in 1927 and 1928. The freight was billed as limestone and thus was carried at a rate lower than the tariff rate on whiting.

Cotton Rates Postponed

On petitions of the railroads, the Interstate Commerce Commission has postponed the effective date of its order in Part 3 of the general rate investigation, prescribing a general revision of freight rates on cotton, from May 28 to June 15. The railroads said they would be unable to prepare their tariffs in time for May 28.

Transport Competition Debated

Representatives of rail, highway and waterway interests debated the question, "What is Fair Competition in Transportation?" in a round-table conference in connection with the annual meeting of the Chamber of Commerce of the United States, at Atlantic City, N. J., on April 29. The discussion was led by Thomas F. Woodlock, assistant editor of the Wall Street Journal. A detailed account of the proceedings will be published in the *Railway Age* of May 9.

The "Speed Witch"

This is the title of a new fast freight train advertised by the New York, New Haven & Hartford and the Pennsylvania which, according to the announcements, will reduce by one-half the time, from maker to user, on merchandise shipped from Boston, Providence, etc., to Philadelphia and Baltimore, and vice versa. The distance from Boston to Baltimore is about 420 miles.

The train will leave Boston at 4:20 p.m., arrive in Philadelphia, 4:15 a.m., and Baltimore, 7:15 a.m.; leave Baltimore, 12:30 p.m., Philadelphia, 4 p.m. and arrive in Boston, 4:15 a.m.

Fifth Oil Power Conference

The fifth oil power conference, under the joint auspices of the Pennsylvania State College and the Lubrication Engineering Committee of the Petroleum Division, American Society of Mechanical Engineers, will be held on May 22, at the Pennsylvania State College, State College, Pa. R. L. Sackett, dean of engineering, will preside at the morning session, at which E. G. Boden, engineer, and O. L. Maag, oil chemist, of the Timken Roller Bearing Company, will discuss lubricant testing. L. J. Bradford, professor of machine design, will present a paper on Bearing Design in the Light of Oil Film Pressure Investigations, and F. O. Willhoft, secretary and general manager of the Isothermos Corporation of America, will present a paper on Fluid Film Lubrication as Applied to Railroad Journal Bearings. There will also be an oral discussion of Lubrication of Railway Bearings, by M. E McDonnell, chief chemist, Pennsylvania Railroad. At the afternoon session, to be presided over by J. G. O'Neill, chief chemist, U. S. Naval Engineering Experiment Station, Annapolis, Md., there will be a Symposium on Internal Combustion Engine Lubrication with Lubricants from Coastal Crudes, Pennsylvania Crudes and Midcontinent Crudes.

Great Opportunities for the Railways

The tendency to exaggerate difficulties has led to some very superficial observations, viz., that railroads are becoming obsolete. The statement that in a machine age the greatest machine of all—the railroads—could be replaced by little machines, or by anything else, even if the competing agencies enjoy partial subsidy and other advantages, cannot be taken seriously. If some of the competitive agencies are found to have a real economic raison d'être, they will be absorbed by the railroad machine, even though that will necessarily imply new investments. The advantages railroads enjoy in the transportation field will make it possible for them to utilize new facilities much more profitably than outside agencies and thus recoup part of the loss of the earlier investment made unproductive by the railroads themselves entering what is now their competitors' field. In the field of dependable and regular transportation railroads will remain supreme.....

The pooling of resources and facilities, allocating traffic, which in the end will result in fewer trains and lesser train hours, should open up large possibilities for savings. There is a lot of wasteful expense now going to feed competition, which in the railroad industry, perhaps more than in any other, scarcely ever produces new traffic. It merely diverts it from one carrier to another. Railroads, like many other industries, need to educate themselves to think in terms of the industry rather than in terms of the individual companies, and adopt a code of ethics which is economically sound.

—From the New York Herald Tribune

New Cars and Locomotives

Class I railroads in the first three months of 1931 placed 3,855 new freight cars in service, as compared with 24,798 in the corresponding period of last year, according to the Car Service Division of the American Railway Association. Of these 1,669 were box cars; 1,884 coal cars; 131 flat cars, and 170 refrigerator cars. The railroads on April 1 had 7,516 new freight cars on order compared with 37,117 on the same day last year.

There were also placed in service in the first three months 34 new locomotives, compared with 189 in the same period in 1930: new locomotives on order on April 1 totaled 86, compared with 442 on the same day last year.

Canadian Pacific Reduces Salaries

E. W. Beatty, president of the Canadian Pacific, announces that on account of decreased traffic further reductions in expenses have become necessary, and the employees in the general offices have agreed to lay off three days each month, equivalent to about a 10 per cent reduction in their pay. At the same time, the officers and members of supervisory staffs will, for the time being, accept a reduction of 10 per cent in their salaries. Reductions in staff have already been carried out to some extent in the shops and in the train service. Mr. Beatty's statement adds that "the dividend policy of the company will be considered by the directors at their next meeting."

Improved Rock Island Passenger Service

The Chicago, Rock Island & Pacific has quickened the schedule of the Iowa-Nebraska Limited, between Chicago and Omaha, 1 hr. 23 min. by consolidating it with the Fast Mail. It now leaves Chicago at 8:25 p. m. instead of 6 p. m. and arrives in Omaha at 8:37 a. m. instead of 7:35 a. m. The schedule of the Colorado Express eastbound between Chicago and Denver, has been cut 1 hr. 15 min. It now leaves Denver at 11 p. m. instead of 9:45, and arrives in Chicago at 6.59 a.m. as formerly. Through schedules from Minneapolis, Minn., to Dallas, Tex., have also been considerably changed; cars now leave Minneapolis at 10:40 p. m. as formerly and Kansas City, Mo., on train No. 17 at 11 a. m. instead of No. 31 and arrive in Dallas at 7:25 p. m.

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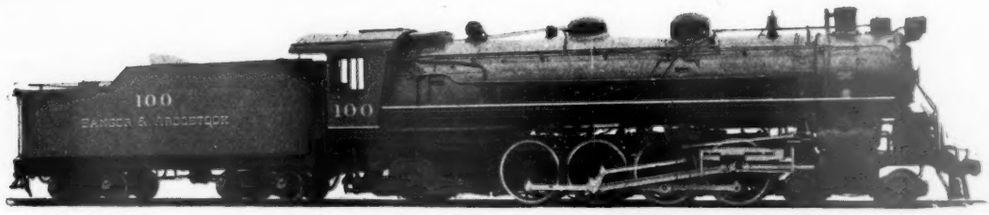
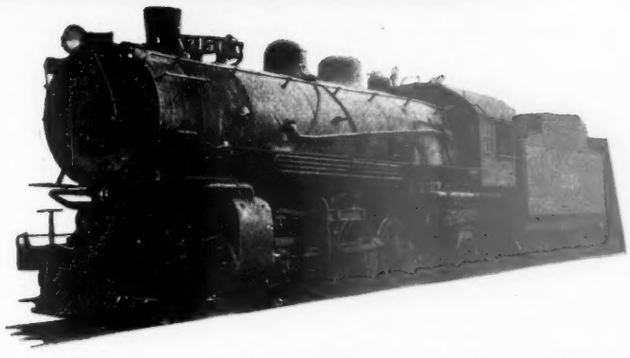
4000 LOCOMOTIVE BOOSTERS

In All Branches of RAILROAD SERVICE





FROM EAST TO WEST

Booster Power Speeds Up Hauling ... adds to railroad revenue

FROM the Bangor & Aroostook to the Southern Pacific and on most systems in between, The Locomotive Booster helps keep operating efficiency at a high pitch.

Over 4000 of these units of reserve power have been applied on 82 railroads to all types of modern locomotives.

On important passenger trains, Booster power speeds up starting and adds to riding comfort. Where grades are heavy it helps bring these trains in on time.

The Booster supplies extra power to start and accelerate high speed scheduled freights to road speeds without delay. Longer freights can be pulled out of sidings and lifted over heavier grades.

And in switching service, the Booster equipped engine handles long freights with little need for cutting. It is always ready to perform light or heavy duties economically.

All branches of railroad service need The Locomotive Booster to meet operating emergencies. Because it speeds up train movements all along the line, it adds to railroad revenues.

FRANKLIN RAILWAY SUPPLY COMPANY, Inc.

NEW YORK CHICAGO ST. LOUIS
SAN FRANCISCO MONTREAL

instead of 3:10 p. m. The schedule of the Apache has been shortened 1 hr. 5 min. between Los Angeles, Cal., and Chicago, the train leaving Los Angeles at 12:05 p. m. instead of 11 a. m. and arriving in Chicago at 7:59 a. m. as formerly.

A Never-Ending Worry

Reporting the annoyance and dangers caused by the mischieveous and malicious practices perpetrated daily by children along its lines the Long Island Railroad has appealed to all clergymen and school principals on Long Island requesting their assistance in ending these activities, which in some cases menace the safety of passengers. The company's police forces since January 1 have apprehended 326 boys for committing damaging acts.

The escapades include stoning and firing at trains; placing iron rods and automobile rims on the third rail; throwing boards, old automobile parts, and in one case a small building, across the tracks; stopping trains with lanterns, and damaging and stealing various kinds of apparatus and machines.

The C. N. R. in March

Gross revenues of the Canadian National for the month of March, 1931, were $15,030,052, a decrease of $3,694,135 as compared with revenues of March, 1930. Operating expenses during March, 1931, were $14,249,112, showing a decrease of $2,018,324 as compared with March last year, leaving net revenue for the month of $780,939, a decrease of $1,675,810 from that of March last year.

Gross revenues for the three months' period ending March 31, 1931, were $42,200,990, a decrease of $10,980,743, while operating expenses for the period were $42,102,528, a deduction of $6,429,986 from the figures of 1930. Net revenue for the first three months of 1931 was $98,461, a decrease of $4,650,756 from the figures of the corresponding period of 1930.

Hot Boxes Not So Frequent

The Chesapeake & Ohio, in the year 1930, had only one hot box for 305,481 car miles and this record, given in the Chesapeake & Ohio Magazine for April, is compared with less successful records back to 1923, when the average was one hot box to each 33,000 miles. This record is credited to the complete cooperation of all individuals and departments having duties connected with this service. Mr. Moler, supervisor of lubrication, says that with proper effort and cooperation, the average can be made one to a million car miles.

Mr. Moler estimates that each hot box costs at least $20, perhaps $30; and, making the estimate at the lower figure, he calculates that the cost of hot journals on his road for 1924 was $299,480; in 1925, $198,260; and so on down to 1930 when the total of cases was 3,564, and the cost was $71,280. The total of these expenses since 1924, on this basis of calculation, is nearly $1,000,000.

For the past eight years, the company's brass foundry at Huntington, W. Va., has made about 216,388 journal brasses yearly, 20 men being employed in the work; but on January 11, last, the foundry was closed for lack of orders and moreover no orders for brasses have been given this year to outside markets. Before this, for at least 30 years, this foundry had made journal bearings each and every day.

Railway Capitalization and Income, 1930

The grand total capitalization of the Class I railways of the United States at the end of 1930 was $19,301,352,139, an increase of $472,228,722 as compared with 1929, according to a preliminary compilation by the Bureau of Statistics of the Interstate Commerce Commission. These figures are exclusive of switching and terminal companies, which had a grand total capitalization of $180,835,771. Of the total capitalization, $8,250,000,295, or 42.7 per cent, was capital stock and $11,051,352,139, or 57.3 per cent, was long-term debt. Interest accruals for the year amounted to $502,673,366, a decrease of $2,759,235 as compared with 1929, and dividends amounted to $505,446,351, an increase of $19,145,404, a large part having been paid from surplus of previous years. The net railway operating income for the year was $868,907,367, a decrease of $382,738,420 under that for 1929.

Milwaukee Receives Second Locomotor

The Chicago, Milwaukee, St. Paul & Pacific has received its second Locomotor, a rail motor coach equipped with a high-pressure, condensing steam power plant, and an initial run was made on April 7, from Chicago to Elgin, Ill., and return. On this run, the car, which was built by the Ryan Car Company, with the power plant furnished by the International Harvester Company, hauled one trailer, and the train was subjected to various operating conditions and rates of speed. The new car is 61 ft. long and weighs 127,000 lb. It is driven by two 8-cylinder uniflow steam engines, capable of developing 225 hp. each, or a total of 450 h.p. Steam is used at 700 lb. pressure. After the trial run, the car was sent to Cedar Rapids, Iowa, where it was placed in service between Cedar Rapids and Ottumwa.

The C. N. R. in Parliament

To show what a live question the administration of the Canadian National is in the Canadian Parliament this session a measure introduced last week in the House of Commons by Hon. Robert J. Manion, Minister of Railways, simply providing for the adding of two members to the board of directors of the railway precipitated a debate which consumed most of an afternoon sitting and an entire sitting of the House. One question raised was that as to whether or not those appointed to the board should be politically prominent, another as to the relation of the board to the government and to the management of the road. Another was the responsibility of the government for giving to Parliament all the information it asked about details of railway management and still another was the extent to which efforts to save on operating expenses this year should be allowed to interfere with necessary railway service. The Minister told the House that the new board of directors were not chosen because they were Conservatives but because they were prominent in business; also that this year the railway planned to save on operating expenses $198,000 in the Atlantic region (Maritime provinces), $500,000 in the Central region (Ontario and Quebec), and $250,000 in the Western region; that there was no use making any more requests for rate reductions either on passenger or freight service as the Government did not intend to ask the railways to assume a larger burden than they now bore.

Bondholders Ask Dismissal of Moffat Tunnel Suit

Holders of the $8,750,000 of supplemental bonds which were isuued by the Moffat Tunnel District to complete the construction of the Moffat Tunnel have filed a petition in the United States district court at Denver Colo., asking the dismissal of the suit which contests the legality of those bonds. The original suit contesting the legality of the bonds was filed by the Denver Land Company, a group of taxpayers in the tunnel tax district, in June, 1928. The district court held the issue to be legal, and the case was appealed to the Colorado supreme court which returned the case to the district court with instructions that the bondholders should be made defendants. Following this action the district court has not yet handed down a decision in the case.

Asks Community to Support Railroads

The Peoria-Pekin Railroads' Traffic Association recently addressed an appeal to taxpayers and business men of Peoria and Pekin, Ill., and surrounding territory, for co-operation in a campaign to aid the railways in meeting unfair competition. The circular lists 13 railways which serve the 50-mile trade area around Peoria and Pekin. In 1929, the statement points out, these carriers contributed to the area $2,493,094 in taxes, while during the same period they employed 27,141 men and paid in salaries $19,096,730. Attention is next called to the fact that during 1930, these railways employed only 24,101 men at a total salary of $17,670,697. As the appeal then goes on to suggest, the depletion of railway revenues, if continued, must necessarily bring about a decrease in the composite purchasing power of these railroad employees.

Club Meetings

The New England Railroad Club will hold its next meeting at the Copley Plaza Hotel, Boston, on Tuesday evening, May 12. This will be the annual banquet and entertainment, and the members and guests will assemble between 5:30 and 6:30, daylight saving time.

The Car Foremen's Association of Omaha, etc., will hold its next meeting in Council Bluffs, Iowa, on Thursday,

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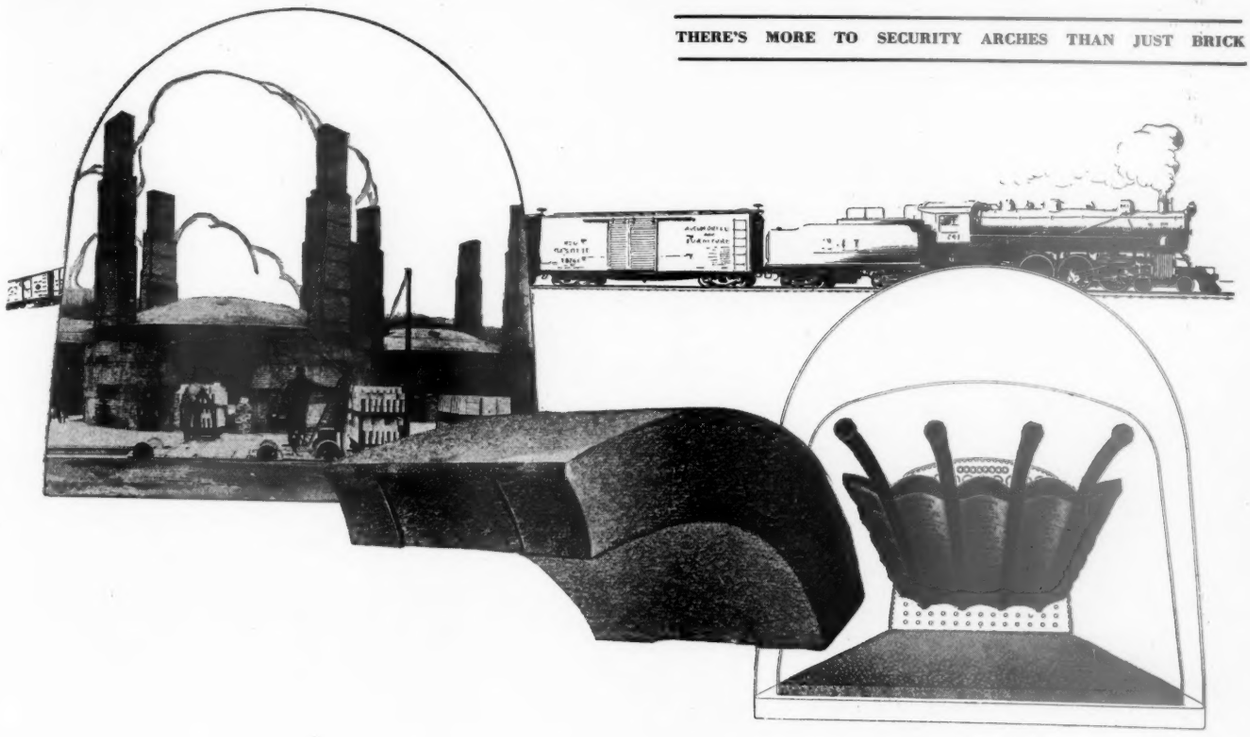
THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK



Locomotives Work Harder

and so do ARCHES

MODERN railroading aims at keeping locomotives continually at work. Long runs and quick turn-arounds pile up mileage very quickly.

Moreover, higher speeds and heavier loads work every part of the locomotive, including the Arch, much more intensively.

Today, the Arch makes its mileage in much shorter time than it did a few years ago and under far more severe conditions.

Everything considered, Arch Brick render better service today than they ever did—a tribute to the constant efforts of the American Arch Company in developing the locomotive Arch.

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists

May 14, at 2 p. m. This will be the election of officers; and H. E. Moran, Chicago Great Western, will speak on cleaning of passenger cars.

The Western Railway Club will hold its next meeting on Friday evening, May 22, at the Hotel Sherman, Chicago. Rev. Ernest S. Tittle, of the First Methodist Church, Evanston, Ill., will speak on Creative Life. The meeting will be preceded by the annual dinner and entertainment. The election of officers also takes place at this meeting.

P. & S. Contest Winners

The fourth annual contest conducted by the Purchases and Stores division of the American Railway Association for papers by junior officers and members of railway purchases and stores departments on subjects relating to the work of those departments resulted in the awarding of the honors to Emmet J. Dennedy, stock clerk in the office of the division storekeeper of the Baltimore & Ohio at Ivorydale, Ohio, and William Courage, trucker at the general stores of the Canadian National at Fort Rouge, Winnipeg, for having written the two best papers. Mr. Dennedy's paper was entitled Mechanical Power, and that of Mr. Courage, Can Future Requirements be Anticipated More Accurately? The two papers share the honors equally and their authors will be rewarded by a trip to the annual convention to be held in Atlanta, Ga., where they will present their papers.

Responsibility for Collision at Switch Connecting Railroads

The Southern Railway contracted with the Evansville, Indianapolis & Terre Haute for a 150-ft. connection between the roads, to be maintained at the expense of the Evansville. Owing to a defect in the switch at the connection, the green light failed to change to red as it should have done, and a Southern train was turned so as to run into a waiting Evansville train. In an action by a passenger in the Southern train for personal injuries, the trial court instructed the jury that if the plaintiff was injured as a direct result of the negligence of either company or of both they should find for the plaintiff. There was a verdict and judgment for the plaintiff, and the judgment was affirmed by the Circuit Court of Appeals, Eighth Circuit, 42 F (2d) 70. This is affirmed by the United States Supreme Court, saying in part:

"The Southern road had not abdicated its control over its main line or its ultimate authority over the switch. If, as the jury must have found under the instructions, the defect in the light was not due to a sudden inevitable accident, but could have been avoided by care, the Southern road owed that care to the plaintiff, and therefore whether the men immediately in contact with the switch were employees of the Evansville or the Southern, the Southern was responsible for this condition to the passengers in its train."—Southern v. Hussey. Decided April 13, 1931. Opinion by Mr. Justice Holmes.

New York-Chicago Airplanes via Harrisburg

A new eight-hour all-air passenger and express service between New York and Chicago, to follow the main line of the Pennsylvania Railroad, has been announced by "Transcontinental & Western Air." Planes leaves Newark (N. J.) airport, 10:45 a.m., standard time; Philadelphia, 11:34; Harrisburg, 12:37 p.m., Pittsburgh, 2:20 p.m.; Columbus, 4 p.m.; Fort Wayne, 4:30 p.m. (Central time), and arrive Chicago, 5:55 p.m. Eastbound they leave Chicago, 12:20 p.m. and arrive at Newark, 8:44 p.m., Eastern standard time. Coaches leave Pennsylvania station, New York, at 10 a.m., standard time, to connect with the planes. The fare through, 800 miles, is $56.

In connection with this air service, the Postal Telegraph Company announces that it will furnish pick-up and delivery service for air express parcels for transportation anywhere on the entire system of Transcontinental & Western Air.

Large Locomotive Tender

One of the largest tenders ever used with a locomotive in passenger train service on any railroad is now being tested on the Pennsylvania. It is 55 ft. 5¼ in. long and 14 ft. 11½ in. high, from the rail to its highest point, with a water capacity of 25,000 gal., a coal capacity of 25 tons (as much as carried by a regular hopper car in the coal trade 50 years ago), and weighs 142,180 lb. empty and 395,800 lb. loaded to capacity. The K4s locomotive and tender combined measure 104 ft. 9½ in. from coupler to coupler. A comparison of the Pennsylvania's first tender, which served the John Bull locomotive, with the modern 25,000-gal. tank is illuminating. The primitive tender was a sheet iron cylinder 6 ft. in diameter, 6 ft. high, standing in a small flat car. It held 1,150 gal. of water. The diminutive tender weighed 19,600 lb., one-twentieth the weight of the latest model.

A K4s locomotive, with its huge tender, has been assigned to the Pennsylvania's Eastern region for test purposes.

The C. P. R. in March

Although the net earnings of the Canadian Pacific for the month of March continued to show a reduction from the corresponding month of 1930, a very encouraging aspect of the showing for the month is the wide expansion over the preceding two months of the current fiscal year, net for March at $1,520,176 being well ahead of February at $513,690, and January at $864,008. It will thus be noted that net for March was nearly three times that of February. In March last year net earnings were $2,139,718. Gross for March was $12,002,263, a reduction of $1,513,534, while operating expenses at $10,482,087 were down $1,893,992.

For the three months ended March 31, gross totalled $33,874,326, a reduction from 1930 of $5,819,869. Expenses were $31,076,451, a reduction of $4,976,562. Net accordingly was $943,308 below that of the like period of 1930, the 1931 figure being $2,897,875 against $3,841,183 in 1930.

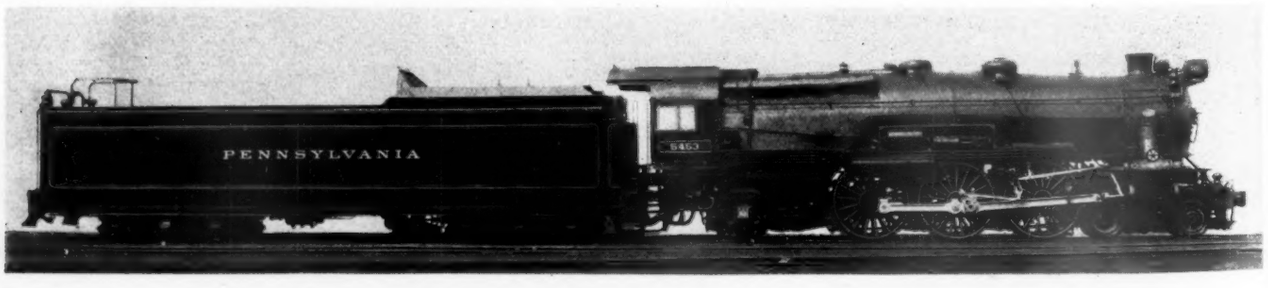
The following table shows earnings, expenses and net profits for the month of March, and for the first quarter of the year, with comparisons:

	MARCH		
	1931	1930	Decr.
	$	$	$
Gross	12,002,262	14,515,798	2,513,534
Exp.	10,482,087	12,376,080	1,893,992
Net	1,520,176	2,139,718	619,541

	THREE MONTHS ENDING MARCH		
	1931	1930	Decr.
	$	$	$
Gross	33,974,326	39,894,196	5,919,869
Exp.	31,076,451	36,053,013	4,976,562
Net	2,897,875	3,841,183	943,308

Montreal and Chicago Trains Faster

The Canadian Pacific and the Canadian National have both reduced passenger train time between Chicago and Montreal, Que., effective April 26. The schedule of the Canadian of the Canadian Pacific has been cut 1 hr. 15 min. eastbound and 2 hr. westbound. The train now leaves Chicago at 7 p.m. instead of 6:30 p.m. and arrives in Montreal at 3:45 p.m. instead of 4:30 p.m. the next day. Returning it leaves Montreal at 3 p.m. instead of 1 p.m. and arrives in Chicago at 8:15 p.m. the next day as formerly. The Canadian National has reduced the schedule of the International Limited eastbound 1 hr. 15 min. and west-



A 25,000-Gal. Tender for a Pennsylvania K4s Locomotive

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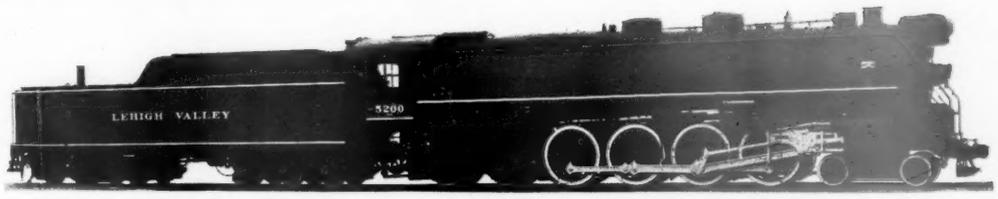
Alco Built



BUILT FOR THE LEHIGH VALLEY

Weight on Drivers, 268,000 pounds; Weight of Engines, 422,000 pounds; Cylinders 26 x 32 inches: Diameter of Drivers, 70 inches; Boiler Pressure, 255 pounds; Maximum Tractive Power with Booster, 85,060 pounds.

"FROM such data as are available, the best modern freight locomotives under intensive utilization may be expected to earn a net return on the investment ranging from 10 to 20 per cent, contributed largely from repairs, fuel and crew wages.

"A 120 million dollar annual investment in freight locomotives alone, providing 6000 new locomotives, in five years, would in that time effect a reduction in the average ton-mile cost of the freight movement of the United States of between 7 and 14 per cent, and with this saving in average costs would go an increase in train speed, the advantages of which, to the railroads and to the country, it would be difficult to evaluate."

If reductions in costs of operation are to continue, locomotive ownership must keep in step with the progress in locomotive efficiency.

Quoted from Railway Age—Jan. 3, 1931

American Locomotive Company

30 Church Street New York N.Y.

bound 20 min. The train now leaves Chicago at 7:15 p.m. instead of 6:45 p.m. and arrives in Montreal at 4 p.m. instead of 4:45 p.m. Returning it leaves Montreal at 3 p.m. as formerly, and arrives in Chicago at 7:55 p.m. instead of 8:15 p.m.

Forty Passengers Killed in Egypt

A press dispatch from Cairo, Egypt, April 29, reports the destruction of a passenger train by fire at Benha, 30 miles north of Cairo, in which 40 or more persons were killed. The report indicates that a car caught fire from a heated journal and that the train ran a long distance before it was stopped, communication with the locomotive being impossible. Some of the passengers were killed by jumping from the train while it was running at full speed. Apparently no action was taken to stop the train until a signalman at Benha gave a stop signal. The passenger coaches were burned down and the metal underframes were so quickly heated as to hamper rescue work.

Pennsylvania Safety Lectures

Pennsylvania Railroad representatives within the past year have addressed more than 5,000 safety rallies in all parts of the railroad and told the story of accident prevention to approximately a million individuals, including half a million school children. Other addresses were before civic organizations, lodges, clubs and churches. In the course of the work many thousands of pamphlets and posters were distributed.

In addressing school children special emphasis was laid on the dangers of trespassing on railroad tracks and in crossing the railroad going to and from school. Small models of the flashing light signal used at grade crossings were demonstrated before the various groups. Many safety meetings were held in factories and industrial plants. The intensive accident prevention program within the railroad's own organization has reduced the number of accidents among employees to a new low record.

Associated Traffic Clubs

The semi-annual meeting of the Associated Traffic Clubs of America will be held at the Palmer House, Chicago, on May 6 and 7, with a program which includes addresses by prominent transportation men. On the first day, Theodore R. Dahl, vice-president of the White Company, will speak on "Highway Transportation"; Paul Shoup, president of the Southern Pacific, on "A National Transportation Problem"; Dr. Howard C. Kidd, professor of transportation of the University of Pittsburgh, on "One Phase of a Program of Regulation"; and Major-General T. Q. Ashburn, chairman of the Inland Waterways Corporation, on "Inland Waterways."

At a banquet on the evening of the first day, W. H. Day, president of the National Industrial Traffic League, will speak on "A National Transportation Problem," and Carl R. Gray, president of the Union Pacific, will talk on "Human Equation in the Railroad Business." On the second day, H. B. Walker, president of the American Steamship Owners Association, will speak on "Coastwise and Intercoastal Steamships," while the balance of the program will include committee reports.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred W. Venton, Crane Company, 836 So. Michigan Blvd., Chicago. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next convention, June 16-18, 1931, West Baden Springs Hotel, West Baden, Ind.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J. 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—A. G. Peck, Acting Secretary, 811 W. 35th Street, Kansas City, Mo. Next meeting June 9-13, 1931, Jefferson Hotel, St. Louis, Mo.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. R. R., 836 Federal St., Chicago. Next convention, October 20-22, 1931, Baltimore, Md.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York. Next convention, September 26-October 2, 1931. Atlantic City, N. J.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.
Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Freight Station Section. — R. O. Wells. Freight Agent, Illinois Central Railroad. Chicago.
Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next convention June 8-9, 1931, Pennsylvania Hotel, New York, N. Y.
Protective Section.—J. C. Caviston, 30 Vesey St., New York. Next convention June 23-25, 1931, Stevens Hotel, Chicago, Ill.
Safety Section.—J. C. Caviston, 30 Vesey St., New York. Annual meeting May 19-21, 1931, Stevens' Hotel, Chicago, Ill.
Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York.
Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.
Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.
Division IV.—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.
Construction and Maintenance Section.—E. H. Fritch. Next meeting, March 15-17, 1932, Palmer House, Chicago.
Electrical Section.—E. H. Fritch.
Signal Section.—R. H. C. Balliet, 30 Vesey St., New York. Annual meeting May 12-13, 1931, Roosevelt Hotel, New York City.
Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago. Next meeting, June 23-25, 1931, Congress Hotel, Chicago.
Equipment Painting Section.—V. R. Hawthorne, 59 East Van Buren St., Chicago.
Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y. Next meeting, May 19-21, 1931, Biltmore Hotel, Atlanta, Ga.
Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago.
Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York, N. Y.
Car Service Division—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 20-22, 1931, Royal York Hotel, Toronto, Ont. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. W. Large, Gen. Agri. Agt., C. R. I. & P. Ry., Chicago, Ill. Annual meeting, June 17-19, 1931, Hotel Benjamin Franklin, Philadelphia, Pa.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss. E. Phillips, N. Y., N. H. & H. Magazine, Boston, Mass. Next meeting, June 4, 1931, Philadelphia, Pa.; June 5, 1931, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Secretary, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Next meeting, January 26-28, 1932, Hotel Jefferson, St. Louis, Mo.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, June 17-19, 1931, Royal York Hotel, Toronto, Ont.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—J. F. Gettrust, Ashton Valve Company, 565 Washington Blvd., Chicago. Meets with International Railway General Foremen's Association.

BOILERMAKERS' SUPPLY MEN'S ASSOCIATION.—Frank C. Hasse, Oxweld R. R. Service Company, 230 N. Michigan Ave., Chicago. Meets with Master Boiler Makers' Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, 2nd Monday in each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago. Exhibit by Supply Men's Association.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, 2nd Monday in month, except June, July, and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Kraüse, Room 299, 610 So. Main St., Los Angeles, Cal. Regular meetings, second Monday of each month, except July, August and September, Room 299, 610 So. Main St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, Mo.—F. G. Wiegman, 720 N. 23rd St., East St. Louis, Ill. Meetings first Tuesday of each month, except July and August, American Hotel Annex, 6th and Market Sts., St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—T. J. O'Donnell, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 453 E. 6th St., Cincinnati, Ohio. Meetings 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, second Monday each month, except July, August, September, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit of International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—W. A. Rockenfield, National Machinery Company, Tiffin, Ohio. Meets with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700 La Salle Street Station, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. M. Huffman, Dearborn Chemical Co., 310 So. Michigan Ave., Chicago. Meets with International Railway Fuel Association.

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A SYMBOL OF SAFETY

In the many plants of Carnegie Steel Company, Safety ranks equally with Production. To promote the practice of Safety, each year a handsome trophy is prepared which is awarded monthly to the plant which has the lowest accident record and is permanently awarded to the plant with the best yearly average. An 86% reduction in lost time accidents in 1929 compared to 1920, the year before this plan was adopted, shows the signal success with which the trophy plan has met.

The 1931 trophy, 30" high, is pictured above. A bronze group, representing the executive, the superintendent and the workman, stands before a silver cross-section of a rail flanked by two car wheels. The whole is mounted on a plinth of bronze beams. William Codman, noted designer of the Gorham Company, was the sculptor.

The inclusion of Carnegie Wrought Steel Wheels in the design of this trophy is a tribute to the remarkable safety record they have made in steam, electric and industrial service. Your safety program will be more effective if Carnegie Wrought Steel Wheels are included in specifications for your equipment.

CARNEGIE STEEL COMPANY - PITTSBURGH

Subsidiary of United States Steel Corporation

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U·S STEEL

MASTER BOILER MAKERS ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y. Exhibit by Boiler Makers Supply Men's Association.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—(See Car Department Officers' Association.)

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual convention, 1931, Richmond, Va.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual convention, May 5-7, 1931, West Baden Springs Hotel, West Baden, Ind.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: J. L. Walsh, Supt. Safety, M.-K.-T. R. R., Dallas, Tex. Annual congress October 12-16, 1931, Hotel Stevens, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. I. McKay, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box, 3275, San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1124 Woodward Building, Washington, D. C. Next convention, June 23-26, 1931, Palmer House, Chicago.

RAILWAY BUSINESS ASSOCIATION. — Frank W. Noxon, 1112 Shoreham Building, Washington, D. C.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meeting, 4th Thursday in each month except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Annual meeting, October 20-22, 1931, Cleveland, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION. —J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division. Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division 1.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Next convention, September, 1931, Buffalo, N. Y.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION. — T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 22-24, 1931, Hotel Stevens, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November. Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson. W. H. Miner, Inc., 667 The Rookery Building, Chicago. Meets with Car Department Officers' Association.

TORONTO RAILWAY CLUB.—J. A. Murphy, 1405 Canadian National Express Building, Toronto. Regular meetings 3rd Monday of each month, except June, July and August.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION. — W. O. Thompson, 1177 East 98th St., Cleveland, O. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 343 So. Dearborn St., Chicago. Regular meetings 3rd Monday each month, except June, July and August.

Equipment and Supplies

LOCOMOTIVES

THE TIENTSIN-PUKOW, Pukow, China, is inquiring for eight locomotives of the 4-6-2 type. T. S. Sun is managing director.

THE DELAWARE & HUDSON contemplates the purchase of one locomotive of the 4-8-0 type. This locomotive will have 311,000 lb. weight on drivers.

THE NATIONAL RAILWAYS OF MEXICO have modernized 60 locomotives and are now planning to modernize 32 class G-39 locomotives, of which the majority are coal burners, by applying superheaters, exterior valve mechanism, fireboxes with thermic syphons, etc. Work on eight of the 32 locomotives will be started immediately.

FREIGHT CARS

THE UNION TANK CAR COMPANY has ordered 15 insulated tank cars of 11,000 gal. capacity, from the American Car & Foundry Company.

THE ERIE has ordered one rolling trunnion type, two-way automatic dump car of 30 cu. yd. and 50 tons' capacity from the Koppel Industrial Car & Equipment Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered four air dump cars from the Western Wheeled Scraper Company. Inquiry for this equipment was reported in the *Railway Age* of April 18.

PASSENGER CARS

THE CANADIAN NATIONAL has placed orders for three new cafe-parlor cars and two new sleeping cars with the Canadian Car & Foundry Company. They will be delivered in September; the cafe cars are for service between Halifax, N. S., and Sydney, and the sleepers between Toronto, Ont., and Ottawa. The sleeping cars will consist of six sections, one drawing-room and four chambrettes, each chambrette, for the first time in Canadian practice, being furnished with both upper and lower berths.

IRON & STEEL

THE PENNSYLVANIA has received bids on 1,300 tons of steel for four bidges.

THE PENNSYLVANIA has ordered 400 tons of structural steel for a bridge at Dayton, Ohio, from the McClintic-Marshall Company.

THE NEW YORK CENTRAL has ordered 105 tons of steel from the American Car & Foundry Company for grade crossing work at Junius, N. Y. This road is inquiring for 425 tons of steel for grillages for foundation work at its yard at Thirtieth street, New York City, and has received bids on 1,740 tons of steel for a cold storage warehouse at 450 West Fourteenth street, New York.

Supply Trade

A. W. Lauder, general sales manager of the **Lyon Metal Products Company**, Aurora, Ill., has been elected vice-president.

The Pacific Car & Foundry Company has purchased the **Bacon Matheson Forge Company** and will move the facilities to Renton, Wash.

Foote Brothers Gear & Machine Company, Chicago, has moved its general offices from 111 North Canal street to 215 North Curtis street.

Frank R. Bacon, who was president of **Cutler-Hammer, Inc.**, Milwaukee, Wis., from 1898 to 1924, when he was made chairman of the board, has been elected president to succeed **Beverly L. Worden**, deceased.

The Commercial Engineering Company, 1800 East street, N. W., Washington, D. C., has been appointed sales agent in the District of Columbia of the **Roller-Smith Company**, New York.

Clarence H. Howard, chairman of the board of the **General Steel Castings Corporation, Clarence H. Howard, Jr.**, manager of the foreign department, and **E. Howard Hooper**, assistant to the chairman, have resigned.

The International Derrick & Equipment Company, Columbus Ohio, and the **Stacey Engineering Company** which operates the P. H. & F. M. Roots Company and the Connersville Blower Company, Connersville, Ind., have merged, forming the **International Stacey Corporation**, with general offices in Columbus, Ohio.

S. M. Kintner, assistant to vice-president of the **Westinghouse Electric & Manufacturing Company**, with headquarters at East Pittsburgh, Pa., has been elected vice-president in charge of engineering, with the same headquarters. Mr. Kintner was graduated from Purdue University with the class of 1894. After graduation he spent a year in telephone construction and operation and then became a member of the faculty of the Western University of Pennsylvania, now the University of Pittsburgh. While there he made original investigations in X-ray, radio telegraphy, lighting, etc. In 1903 he joined the forces of the Westinghouse Electric & Manufacturing Company as an engineer on research of high tension phenomena, lightning arresters, line and apparatus protection, etc. Four years later he became connected with the railway engineering department and had

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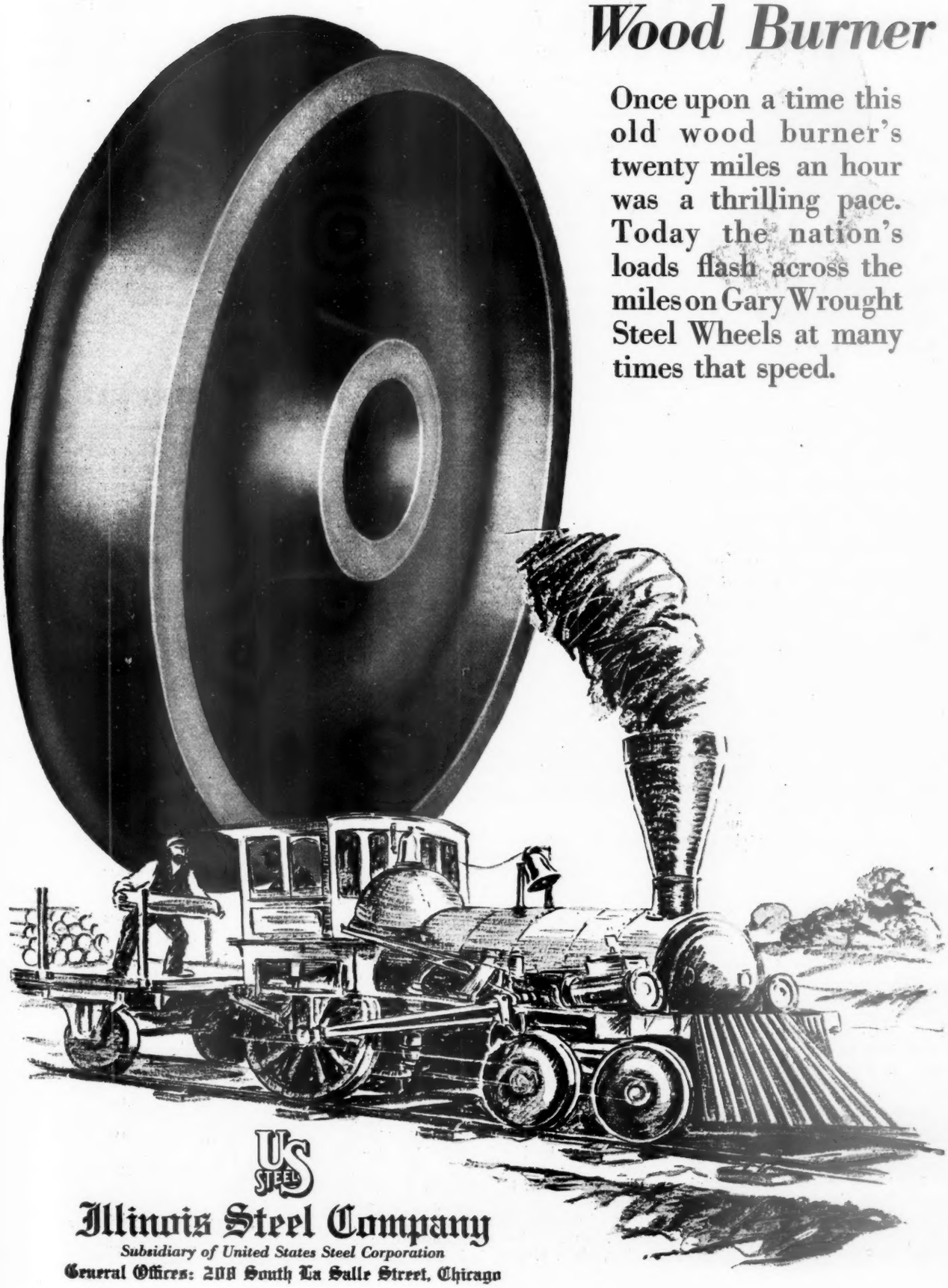
The Puffing Wood Burner

Once upon a time this old wood burner's twenty miles an hour was a thrilling pace. Today the nation's loads flash across the miles on Gary Wrought Steel Wheels at many times that speed.



U S STEEL

Illinois Steel Company

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charge of alternating current railway motor design. He held this position until 1911, when he joined the National Electrical Signaling Company as general manager and during this period he made

S. M. Kintner

telephone interference investigations, also investigations of alternating current and electrolysis and was in charge of the motor designs of the New York, New Haven & Hartford, Sarnia Tunnel and other installations. He has given many years to the study and development of radio telegraphy and telephony. In 1899 he became interested in the experimental work of Prof. Fessenden and assisted him in much of his work. Mr. Kintner was general manager of the National Electrical Signaling Company in 1911 and later served as one of its receivers until 1917 when the company was reorganized as the International Radio Telegraph Company. With this company he was both vice-president and president at different times. In September, 1920, he again became associated with the Westinghouse Electric & Manufacturing Company and from that time until he was appointed manager of the research department in 1922, had been engaged in research and engineering duties in developing radio apparatus. He was later appointed assistant to vice-president in charge of engineering and now becomes vice-president in charge of engineering.

OBITUARY

Robert L. Kittle, who has been in charge of railway sales for the Manhattan division of Raybestos-Manhattan, Inc., with headquarters at Chicago, died from heart failure in that city on April 25 while playing golf. During 1907 and 1908 he was general superintendent of the Dyersburg Northern, now a part of the Illinois Central.

W. W. Neale, traveling engineer with office at Baltimore, Md., for the American Arch Company, Inc., New York, died on April 23 at Baltimore. Mr. Neale had been connected with the American Arch Company for the past 18 years and previous to that had served with the Baltimore & Ohio in its mechanical department.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract for the construction of a bolt house at the rail mill at Newton, Kan., has been let to M. R. Stauffer, Newton.

ATCHISON, TOPEKA & SANTA FE.—This company has applied to the Interstate Commerce Commission for authority to construct an extension of 5 miles east from Loving, N. M.

CANADIAN NATIONAL.—A contract for the construction of a rearrangement of line at Fort William, Ont., at a total cost of about $300,000, has been let to Chambers, McCaffrey & McQuigge, Fort William.

CHICAGO GREAT WESTERN.—The Iowa State Highway Commission has awarded a contract to Amos Delbert, Cedar Rapids, Iowa, for the construction of a grade separation structure at the tracks of this company on Highway No. 55 north of Dubuque, Iowa, at a cost of $58,400.

CHICAGO, ROCK ISLAND & PACIFIC.—The Iowa State Highway Commission has awarded a contract for the construction of a grade separation structure where Highway No. 161 crosses this railroad's tracks east of Ainsworth, Iowa, to the Iowa Bridge Company, Des Moines, Iowa.

ILLINOIS CENTRAL. — This company closed bids on May 1 for the construction of a new freight station on Front street, East St. Louis, Ill., to replace a structure destroyed by fire several months ago. The new station will be constructed of reinforced concrete and brick, will be one and two stories in height, with outside dimensions of 800 ft. by 100 ft., and will involve a total expenditure of about $300,000.

LOS ANGELES & SALT LAKE.—The Interstate Commerce Commission has authorized this company to construct a line from its San Pedro, Cal., branch southward through Long Beach and Los Angeles to a connection with an existing yard track, 7.6 miles, and to operate as a part of the proposed line an existing spur 2.5 miles long. The road has likewise been authorized to abandon a portion of its San Pedro branch, 2.2 miles. The purpose of this authorization is to enable the company to construct a cut-off and abandon a line running through a residential section. The cost of the project is estimated at $1,278,330, exclusive of land.

NATIONAL OF MEXICO.—This company plans the construction of a 50-stall roundhouse with 100-ft. turntable at Monterrey, N. L.

TEMISKAMING & NORTHERN ONTARIO-NIPISSING CENTRAL.—A contract has been awarded to the Dominion Bridge Company for the construction of the superstructure of a grade separation structure to carry Ferguson highway over the tracks of these companies at Lang street, Cobalt, Ont. The total cost of the project, about $50,000, is being borne by the two railroads and the Ontario Government Northern Development Department.

TRINITY VALLEY & NORTHERN.—The Interstate Commerce Commission has denied the application of this company for authority to construct a line of railroad from Cleveland, Texas, southeastward to Havens, 12 miles.

UNION PACIFIC.—A contract has been awarded to Fairbanks, Morse & Co., Chicago, for the construction of a 450-ton steel locomotive coaling and sanding station at Marysville, Kan., with full automatic skip hoist.

WABASH.—The general contract for the construction of a 1,000,000-bu. reinforced concrete addition to the grain elevator of this company at North Kansas City, Mo., which is under lease to the Uhlmann Grain Company, has been awarded to the Burrell Engineering & Construction Co., Chicago.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Bond.*—The Interstate Commerce Commission has authorized the North Texas & Santa Fe to issue a registered first mortgage 6 per cent gold bond, series B, for $650,000 to be delivered to the A.T. & S.F. in satisfaction of indebtedness.

BESSEMER AND LAKE ERIE.—*Annual Report.*—The annual report of this company for 1930 shows net income after interest and other charges of $4,849,120, as compared with net income in 1929 of $7,088,666. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average Mileage Operated	227.75	227.75	.....
RAILWAY OPERATING REVENUES	$14,712,458	$17,912,973	—$3,200,515
Maintenance of way	1,290,676	1,355,491	— 64,814
Maintenance of equipment	3,995,680	3,971,547	+ 24,132
Transportation	3,350,337	3,909,532	— 559,195
TOTAL OPERATING EXPENSES	9,295,345	9,847,698	— 552,352
NET REVENUE FROM OPERATIONS	5,417,112	8,065,275	— 2,648,163
Railway tax accruals	676,677	891,638	— 214,960
Railway operating income	4,740,380	7,173,548	— 2,433,168
Hire of freight cars—Dr.	51,761	202,195	— 253,957
Joint facility rents	31,793	41,715	— 9,922
Non-operating income	436,934	880,155	— 443,221
GROSS INCOME	5,177,314	8,053,704	— 2,876,389
Rent for leased roads	5,963	6,236	— 272
Interest on funded debt	643,670	680,070	— 36,400

Continued on Next Left Hand Page

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to protect railway piping from atmospheric corrosion

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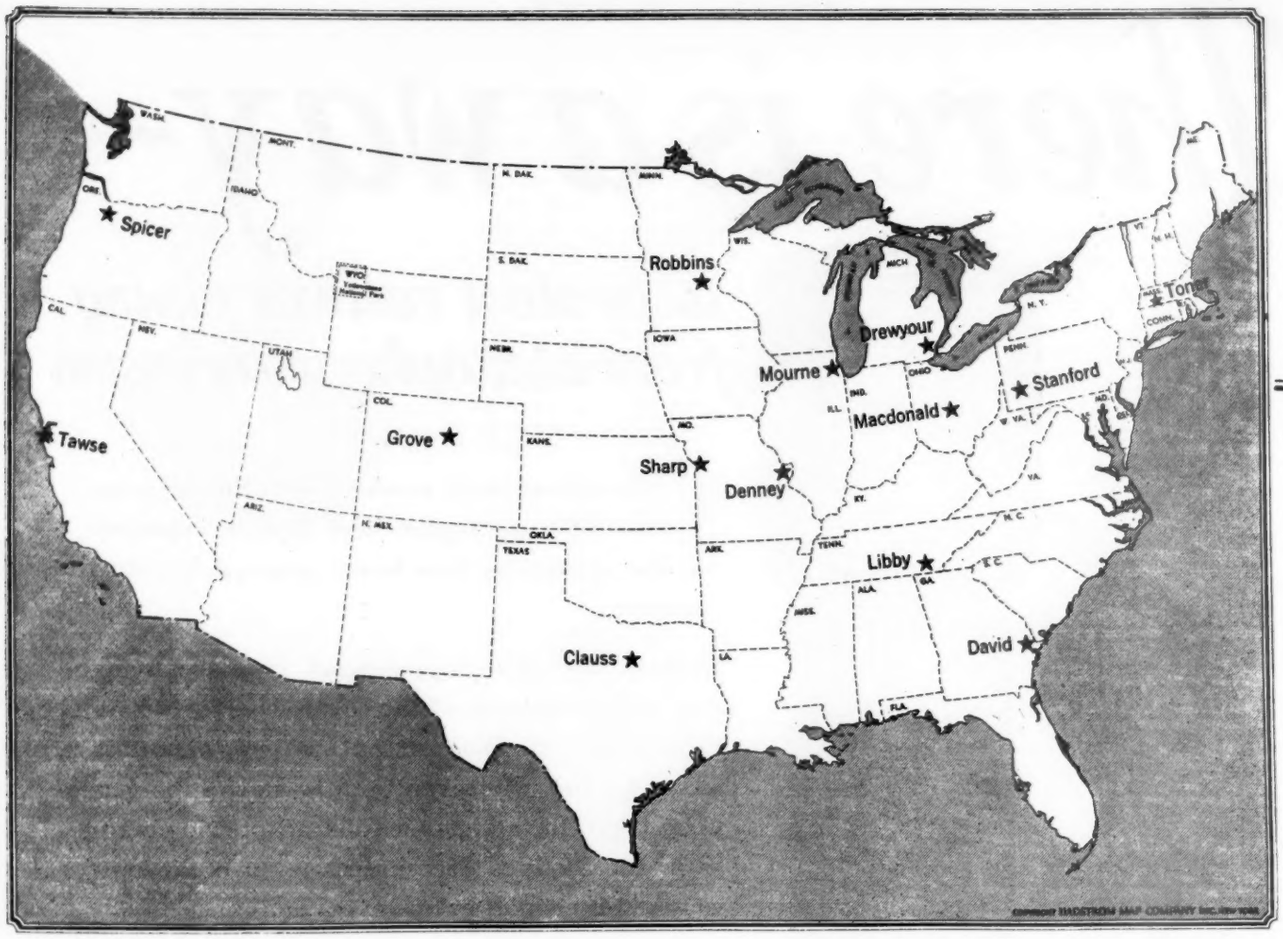

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A-598

	1930	1929	Increase or Decrease
Net Railway Operating Income	14,006,913	20,874,749	— 6,867,835
Non-operating income	3,722,858	4,024,730	— 301,872
Interest on funded debt	10,556,912	10,701,248	— 144,336
Total Deductions from Gross Income	11,123,689	11,176,713	— 53,024
Net Income	$6,606,082	$13,702,766	— $7,116,684

Minneapolis, St. Paul & Sault Ste. Marie. — *Abandonment.* — This company has applied to the Interstate Commerce Commission for authority to abandon its Knox branch, from Brantwood, Wis., to Knox, 4.89 miles.

Minneapolis, St. Paul & Sault Ste. Marie.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that portion of a branch line extending from Birchwood, Wis., northeasterly to Reserve, 18.5 miles.

Mississippi Central.—*Annual Report.*—The annual report of this company for 1930 shows net income, after interest and other charges, of $17,065, as compared with net income of $255,411 in 1929. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average Mileage Operated	148.38	154.51	— 6.13
Railway Operating Revenues	$1,317,572	$1,644,922	—$327,350
Maintenance of way	234,608	221,781	+ 12,827
Maintenance of equipment	252,022	314,782	— 62,760
Transportation	381,163	431,914	— 50,751
Total Operating Expenses	1,095,644	1,184,062	— 88,418
Operating ratio	83.16	71.98	+ 11.18
Net Revenue from Operations	221,927	460,860	— 238,933
Railway tax accruals	63,033	111,860	— 48,827
Railway operating income	158,849	348,888	— 190,039
Joint facility rents—Net	14,591	12,992	+ 1,599
Gross Income	189,813	406,527	— 216,714
Interest on funded debt	120,292	127,097	— 6,805
Net Income	$17,065	$255,411	—$238,346

Missouri Pacific.—*Acquisition.*—Examiner M. S. Jameson of the Interstate Commerce Commission has recommended in a proposed report that this company be authorized to acquire and operate the line of the Doniphan, Kennett & Searcy, 7.25 miles, in White county, Ark.

New Orleans, Texas & Mexico.—*Annual Report.*—The annual report of this company for 1930 shows net income after interest and other charges of $1,101,801, as compared with net income of $1,135,159 in 1929. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average Mileage Operated	1,026.44	1,026.44	.....
Railway Operating Revenues	$15,428,421	$15,236,465	+$191,955
Maintenance of way	2,393,130	2,419,790	— 26,660
Maintenance of equip't	2,724,165	2,555,360	+ 168,804
Transportation	4,162,727	4,395,424	— 232,697
Total Operating Expenses	10,579,578	10,615,759	— 96,180
Operating ratio	68.18	69.67	— 1.49
Net Revenue from Operations	4,908,842	4,620,706	+ 288,136
Railway tax accruals	576,896	646,987	— 70,091
Railway operating income	4,322,877	3,958,166	+ 364,710
Hire of freight cars—Dr.	682,882	609,661	+ 73,220
Joint facility rents	273,379	246,163	+ 27,216
Net Railway Operating Income	3,332,872	3,156,096	+ 176,776
Non-operating income	484,523	492,243	— 7,719
Gross Income	3,817,395	3,648,339	+ 169,055
Rent for leased roads	51,311	53,101	— 1,789
Interest on funded debt	2,517,888	2,440,965	+ 76,922
Total Deductions from Gross Income	2,715,593	2,513,179	+ 202,414
Net Income	$1,101,801	$1,135,159	— $33,357

New York Central.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and the Boston & Albany to abandon operation and the Chester & Becket to abandon as to interstate and foreign commerce, the entire line of the latter company, approximately 5 miles, in Hampden and Berkshire Counties, Mass.

Pittsburgh & Lake Erie.—*Extra Dividend.*—The directors of this company have declared an extra dividend of $5.00 a share. A similar extra payment was made last year.

Richmond, Fredericksburg & Potomac.—*Annual Report.*—The annual report of this company for 1930 shows net income after interest and other charges of $1,125,681, as compared with net income of $2,256,972 in 1929. Selected items from the Income Statement follow:

	1930	Increase or Decrease
Railway Operating Revenues	$10,343,438	—$1,500,385
Maintenance of way	1,346,878	— 100,525
Maintenance of equipment	1,995,634	— 16,120
Transportation	3,699,221	— 191,543
Total Operating Expenses	7,876,346	— 266,119
Operating ratio	76.15	+ 7.40
Net Revenue from Operations	2,467,092	— 1,234,266
Railway tax accruals	546,677	134,974
Railway operating income	1,920,383	— 1,099,164
Hire of equipment—Dr.	525,946	+ 35,017
Joint facility rents—Dr.	86,600	— 7,073
Net Railway Operating Income	1,307,836	— 1,127,107
Non-operating income	172,153	10,477
Gross Income	1,479,989	— 1,137,584
Interest on funded debt	339,479	— 5,622
Total Deductions from Gross Income	354,308	— 6,293
Net Income	$1,125,681	—$1,131,291

Terminal Railroad Association of St. Louis.—*New Directors.*—M. H. Cahill, president of the Missouri-Kansas-Texas Lines; C. S. Millard, vice-president and general manager of the Cleveland, Cincinnati, Chicago & St. Louis, and C. T. O'Neal, president of the Chicago & Eastern Illinois, have been elected members of the board of directors succeeding, Columbus Haile, former president of the Katy; H. A. Worcester, vice-president of the New York Central Lines and T. C. Powell, chairman of the board of the C. & E. I., respectively.

Texas & Pacific.—*Annual Report.*—The annual report of this company for 1930 shows net income after interest and other charges of $3,652,191, as compared with net income of $6,130,074 in 1929. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average Mileage Operated	1,955.62	1,994.85	— 39.23
Railway Operating Revenues	$37,542,301	$45,696,434	—$8,154,132
Maintenance of way	5,638,322	7,395,147	— 1,756,824
Maintenance of equip't.	6,226,465	7,801,173	— 1,574,707
Transportation	12,005,451	14,144,602	— 2,139,150
Total Operating Expenses	26,421,278	31,849,720	— 5,428,442
Operating ratio	70.38	69.70	+ 2.68
Net Revenue from Operations	11,121,022	13,846,713	— 2,725,690
Railway operating income	9,374,023	11,586,255	— 2,212,232
Hire of freight cars—Dr.	2,250,118	2,789,012	— 538,894
Joint facility rents	34,604	114,698	— 80,094
Net Railway Operating Income	7,235,687	8,778,382	— 1,542,695
Non-operating income	507,047	1,113,607	— 606,560
Gross Income	7,742,734	9,891,990	— 2,149,255
Interest on funded debt	3,918,576	3,620,135	+ 298,441
Total Deductions from Gross Income	4,090,543	3,761,915	+ 328,627
Net Income	$3,652,191	$6,130,074	—$2,477,882

Dividends Declared

Central Railroad of New Jersey.—2 per cent, quarterly, payable May 15 to holders of record May 4.

Georgia Southern & Florida.—First Preferred, 2½ per cent, payable May 29 to holders of record May 15.

Hudson & Manhattan.—Common, 1¾ per cent, quarterly, payable June 1 to holders of record May 15.

Illinois Central.—Common, $1.00, quarterly, payable June 1 to holders of record May 8.

Maine Central.—Preferred, 1¾ per cent, quarterly, payable June 1 to holders of record May 15.

Norfolk & Western.—Common, $2.50, quarterly, payable June 19 to holders of record May 29.

Reading Company.—First Preferred, $.50, quarterly, payable June 11 to holders of record May 21.

Average Prices of Stocks and of Bonds

	Apr. 28	Last week	Last year
Average price of 20 representative railway stocks.	73.14	75.84	127.48
Average price of 20 representative railway bonds..	91.29	91.58	93.28

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BETTER FIRES

FIREBAR CORPORATION
CLEVELAND OHIO.

Railway Officers

EXECUTIVE

O. H. Nance, vice-president and general manager of the Canton Railroad, has been appointed president, with headquarters as before at Baltimore, Md.

J. W. Roberts, assistant vice-president of the Pennsylvania, in the operating department of the New York zone, with special jurisdiction over the handling of perishable produce, and general supervision over the perishable traffic of the Pennsylvania system, has been transferred to the traffic department, with the same title and duties. Mr. Roberts will have headquarters, as before, at New York.

John W. Redmond, general counsel of the Central Vermont, who was recently appointed vice-president in charge of legal affairs, was born in Charlotte, Vt., on January 24, 1861. Mr. Redmond was educated at St. Johnsbury Academy and the University of Vermont, at Burlington. After graduation from the University of Vermont in 1886, Mr. Redmond became interested in educational matters. During the period 1886 to 1891, inclusive, he served as county examiner of Lamoille County; and in 1906

John W. Redmond

he was appointed chairman of the Vermont Public Service Commission, serving as head of that board until 1913. He was appointed reporter of decisions of the Supreme Court of Vermont in 1904, holding that office until he became associated with the Central Vermont Railway as general counsel in 1915. At the time of the Vermont flood in 1927, Mr. Redmond was appointed as one of the receivers of the Central Vermont. Upon the organization of the new company, he was named as a director and in 1930 he was elected general counsel, which position he filled until elected vice-president in charge of legal affairs at the 1931 annual meeting.

FINANCIAL, LEGAL AND ACCOUNTING

L. E. McKeand, treasurer and assistant comptroller of the Nashville, Chattanooga & St. Louis, has been appointed comptroller; **D. S. Huggins**, assistant secretary, assistant treasurer and transfer agent, has been appointed treasurer, and **Elmer Tarkington** has been appointed assistant treasurer. All will have headquarters at Nashville, Tenn.

Edward Beecroft, who has been elected secretary and treasurer of the Elgin, Joliet & Eastern, with headquarters at Chicago, has been connected with that railroad for nearly 35 years. He was born in Chicago on June 1, 1881, and attended the West Division High School in that city. Mr. Beecroft entered railway service at the age of 15 years in

Edward Beecroft

the accounting department of the Elgin, Joliet & Eastern at Chicago. Two years later he was transferred to the secretary and treasurer's department and in 1908 he was advanced to assistant cashier. On November 12, 1913, he was promoted to assistant secretary and assistant treasurer, his election to secretary and treasurer becoming effective on May 1.

William D. Steele, auditor, freight accounts, of the Seaboard Air Line, has been appointed auditor of revenues, and his former position, as well as the positions of auditor, passenger accounts, and auditor, station accounts, have been abolished. Mr. Steele was born at Rock Hill, S. C., on November 28, 1887, and attended public school and studied for a year at Catawba Military Academy, at Rock Hill. He entered railway service on September 1, 1902, with the Southern, as an office boy in the local freight office at Rock Hill, and later served at various points as bill clerk, rate clerk, claim clerk, cashier, agent and traveling auditor, with other roads in the southeast. In August, 1917, Mr. Steele entered the service on the Tennessee Central as station accountant in the auditor's office at Nashville, Tenn. He resigned in February, 1920, to go with the Seaboard Air Line as traveling accountant, resigning in August of the same year to become special accountant with the Nashville, Chattanooga & St. Louis, at Nashville, Tenn., being assigned to the preparation of special reports which were used in the final settlement between the N., C. & St. L. and the United States Railroad Administration. He re-

William D. Steele

signed on December 4, 1920, and became chief clerk to the auditor of the subsidiary lines of the Seaboard Air Line at Portsmouth, Va. Mr. Steele was advanced to assistant to auditor of the subsidiary lines in March, 1922, and in October of the same year was transferred to the auditor of freight accounts' office of the Seaboard Air Line as chief clerk to the auditor of freight accounts. Mr. Steele became assistant to the auditor of freight accounts on January 1, 1924, and in January, 1928, he was advanced to auditor of freight accounts, the position he held until his recent appointment.

OPERATING

Peter F. Frenzer, superintendent of telegraph of the Union Pacific Railroad, has been promoted to superintendent of telegraph of the Union Pacific System, with headquarters as before at Omaha, Neb.

F. E. French has been appointed assistant superintendent on the Central district of the Chicago, Burlington & Quincy, with headquarters at Ottumwa, Iowa. **W. P. Wilson** has been appointed trainmaster of the Sterling division, with headquarters at Bridgeport, Neb.

David S. Alonso, superintendent of the Hidalgo division and the Mexico City Terminals of the National of Mexico, with headquarters at Peralvillo, D. F., has also been appointed assistant to the general superintendent of transportation, with headquarters at Colonia station, Mexico, D. F., succeeding **Manual J. Macias**, who has been appointed superintendent of the Pacific division, with headquarters at Acambaro, Gto., to succeed **Miguel G. Navarro**, deceased. The headquarters of **J. J. Franco**, general superintendent of transportation, have been moved to Colonia station, Mexico City.

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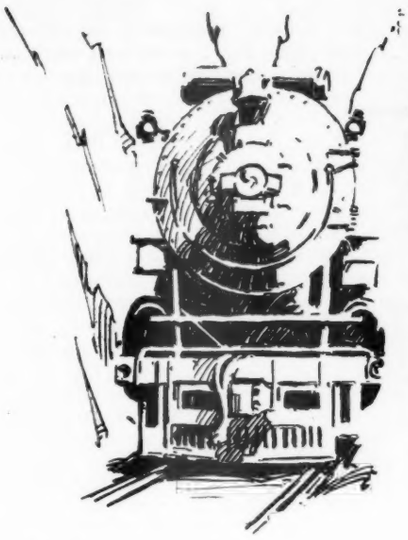

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R. H. Smith, division superintendent of the Norfolk & Western, has been promoted to general superintendent of the eastern general division, succeeding **J. T. Carey,** retired. Mr. Smith's headquarters will be located at Roanoke, Va., as before. **W. O. Franklin** has been appointed superintendent of the Radford division, with headquarters at Roanoke, and his former position, that of superintendent of the Pocahontas division, with headquarters at Bluefield, W. Va., has been assigned to **W. O. Tracey,** who in turn is succeeded as assistant superintendent of the Pocahontas division by **J. R. Derrick. O. M. Dawson,** assistant superintendent of the Shenandoah division, which position has been discontinued, has been appointed to succeed Mr. Derrick as assistant superintendent of the Radford division, with headquarters as before at Roanoke, Va.

The National of Mexico on May 1 consolidated the Aguascalientes division with the Durango division, with **Margarito Ramirez,** superintendent of the Aguascalientes division, as superintendent of the combined division, with headquarters as before at Aguascalientes, Ags. On June 1 the jurisdiction of the Aguascalientes-Durango division will be extended to include the Salinas district of the Cardenas division, giving the former division a total mileage of 831. The Chihuahua division was consolidated with the Torreon division on May 1 in charge of **Juan Mejia,** superintendent of the former division, with new headquarters at Torreon, Coah., and with a total mileage of 1,195. On June 1 the limits of the Monterrey-Norte division will be extended to include 716 miles of line. The Monterrey-Golfo division will be consolidated with the Monclova division on the same date, with headquarters at Monterrey, N. L., and with a jurisdiction covering 917 miles of line. An assistant superintendent will be located at Monclova, Coah. The Mexico-Queretaro division has been extended to include 639 miles of line and the headquarters of **Alberto M. Bribiesca,** superintendent, will be moved to Queretaro, Qro., on June 1. The Hidalgo division will be extended on the same date so that it will include 415 miles of line.

TRAFFIC

Effective May 1, the Columbus, Ohio, office of the Western Maryland, will be transferred to 437 Dixie Terminal Building, Cincinnati, Ohio.

E. H. Smith has been appointed general agent of the Chicago, Burlington & Quincy at Philadelphia, Pa., succeeding **H. K. Miles,** who has been transferred to New York, to succeed **W. S. Dewey,** deceased.

E. E. Eckert, division freight agent on the Akron, Canton & Youngstown at Akron, Ohio, has been promoted to industrial agent, with headquarters at the same point, succeeding **H. L. Sovacool,** who has resigned to enter other service.

F. W. Fischer has been appointed general agent for the Erie at Columbus, Ohio, succeeding **J. G. Vreeland,** who has been transferred to Milwaukee, Wis. Mr. Vreeland replaces **C. E. King,** who has been transferred to Akron, Ohio, where he succeeds **Allan Barr,** who has resigned.

H. F. Cary, general passenger agent of the Southern, with headquarters at Cincinnati, Ohio, has been promoted to assistant passenger traffic manager, with headquarters at the same point. **F. N. Westerman,** assistant general passenger agent at Cincinnati, has been promoted to general passenger agent at that point, succeeding Mr. Cary.

V. L. Estes, who was recently appointed general passenger agent of the Southern, with headquarters at Jacksonville, Fla., was born at Atlanta, Ga., on September 23, 1883, and received his education at the public schools of Orlando, Fla. He began his railroad career with the Southern on September 1, 1903, and served in a clerical capacity at various ticket offices at Jacksonville, Atlanta, and Charleston, S. C., until March 15, 1910, when he was appointed chief clerk to assistant general passenger agent at Atlanta. From August, 1918, to March 1, 1920, during the United States Railroad Administration, Mr. Estes was chief clerk to the southern passenger traffic committee. After the period of Federal control, Mr. Estes was appointed district passenger agent of the Southern at Atlanta, and on May 1, 1924, he became division passenger agent at Jacksonville, the position he held until his recent appointment as general passenger agent.

J. W. Graham, formerly vice-president in charge of traffic of the New York, Chicago & St. Louis, has been appointed assistant freight traffic manager in charge of solicitation, with headquarters at Toledo, Ohio. **R. A. Williamson,** general freight agent, has been promoted to assistant freight traffic manager, with headquarters as before at Cleveland, Ohio, in charge of rate legislation and tariff matters. **H. L. Baird,** assistant general freight agent, has been promoted to general freight agent, with headquarters as before at Cleveland, devoting his attention to rate legislation and tariff matters, succeeding Mr. Williamson. **W. J. Courtney,** chief of the tariff bureau at Cleveland, has been promoted to assistant general freight agent for rate legislation and tariff matters, succeeding Mr. Baird. **B. A. Gaetz** has been promoted to chief of the tariff bureau to succeed Mr. Courtney.

Frank Lee Jenkins, recently appointed passenger traffic manager of the Southern, with headquarters at Washington, D. C., was born at Statesville, N. C., on November 28, 1881. He received his education at Oak Ridge Institute, Oak Ridge, N. C., and Statesville College, Statesville, N. C. On November 1, 1900, Mr. Jenkins commenced his railway career with the Southern as clerk in the city passenger and freight office at Charlotte, N. C. He served as ticket agent in offices at Augusta, Ga., and Charleston, S. C., until July 1, 1911, when he was appointed traveling passenger agent at Augusta. On March 1, 1912, he was appointed district passenger agent at Washington, and on November 1, 1915, he was transferred to a similar position at Birmingham, Ala. On April 1, 1917, Mr. Jenkins was appointed division passenger agent at Birmingham, and two months later he was assigned the position of special passenger representative with headquarters at Atlanta, Ga. In August, 1917, he was sent to Jacksonville, Fla., to take over the position of division passenger agent at that point, and in May, 1918, was transferred to Birmingham in the same capacity. On March 1, 1920, he was appointed district passenger agent at Philadelphia, Pa., and on July 15, 1926, he became assistant general passenger agent at Washington, the position he held until his recent promotion.

W. S. Merchant, passenger traffic manager of the St. Louis-San Fancisco, has been promoted to assistant general traffic manager, with headquarters as before at St. Louis, Mo. Mr. Merchant will continue the direct supervision of the passenger traffic department, and, under the direction of the general traffic manager, will supervise all solicitation matters, both freight and passenger. Mr. Merchant was born at Vincennes, Ind., and obtained his academic education in the public schools in that city

W. S. Merchant

and at Vincennes University. He entered railway service as a stenographer for the Baltimore & Ohio at Vincennes and later sold tickets at the Vincennes Union station. Following this he served successively as chief clerk to the division superintendent of the Baltimore & Ohio at Washington, Ind., clerk in the traffic department of the Illinois Central at Chicago, clerk in the rate department of the Chicago, Burlington & Qunicy at Chicago, passenger agent for the Burlington and city passenger agent in the joint office of the Frisco, the

Chicago, Rock Island & Pacific and the Chicago & Eastern Illinois at Chicago. In 1909 he was appointed traveling passenger agent for the Frisco at New York and several years later he was advanced to district passenger agent at Cincinnati. During the World war Mr. Merchant was loaned to the Liberty Loan organization and served as director of transportation for the Eighth Federal Reserve district at St. Louis, in charge of traffic matters pertaining to war exhibit trains and speakers. In 1920 he returned to the Frisco as general agent at Chicago, where he remained until 1923 when he was advanced to general eastern agent at New York. Mr. Merchant was promoted to passenger traffic manager of the Frisco in September, 1930, and his further promotion to assistant general traffic manager became effective on April 22.

ENGINEERING AND SIGNALING

Heron Cabrera, formerly engineer of right of way on the National of Mexico at Tampico, Tam., has been appointed chief engineer, with headquarters at Mexico, D. F., succeeding **Aurelio Chavez,** deceased.

MECHANICAL

J. Horrigan, superintendent of motive power of the Elgin, Joliet & Eastern, will retire on May 1, and **J. C. Shreeve,** master mechanic, has been appointed to succeed Mr. Horrigan, with headquarters at Joliet, Ill., as before.

PURCHASES AND STORES

Ralph I. Renfrew has been appointed district storekeeper of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Beech Grove, Ind., succeeding **C. V. Coulter,** retired on pension account of reaching the age limit.

OBITUARY

R. F. Garcia, assistant superintendent of the Mexico-Queretaro division of the National of Mexico, with headquarters at Mexico, D. F., died in that city on April 21.

Miguel G. Navarro, superintendent of the Pacific division of the National of Mexico, with headquarters at Acambaro, Gto., died on February 23 from cancer of the throat. Mr. Navarro entered railway service with the National Railways in 1892 as a warehouseman at Maravatio, Micho. At one time he was superintendent of the Southern district of the National Railways, which included all the divisions south of Mexico, D. F.

Aurelio Chavez, chief engineer of the National of Mexico, with headquarters at Mexico, D. F., died in that city on April 20, from injuries received when his inspection motor car was derailed on the Cuernavaca branch on April 18.

Ross Malcomb Stubbs, bridge engineer of the Missouri-Kansas-Texas at St. Louis, Mo., died suddenly at St. John's hospital in St. Louis, on April 19. Mr. Stubbs was born on February 1, 1886, at Terre Haute, Ind., and attended the public schools of his native city, later obtaining his degree in civil and electrical engineering at the Rose Polytechnic Institute. He had been in the continuous service of the M-K-T for 13 years, having commenced service in St. Louis on August 1, 1918, as assistant bridge engineer. On March 1, of the following year he was appointed bridge engineer at Dallas, Tex., and a year later was transferred to St. Louis. Prior to his connection with the Katy, Mr. Stubbs had been assistant bridge engineer for the Vandalia railroad (now part of the Pennsylvania).

Annual Report

Fourteenth Annual Report of Missouri Pacific Railroad Company Year Ended December 31, 1930

St. Louis, Mo., April 14, 1931.

TO THE STOCKHOLDERS:

There is submitted herewith report of the operations and affairs of the Company as of December 31, 1930.

Corporate Income Statement

FOR THE YEAR ENDED DECEMBER 31, 1930, COMPARED WITH THE PREVIOUS YEAR

	1930	1929	Decrease
Railway Operating Revenues	$120,187,689.14	*$139,807,914.55	$19,620,225.41
Railway Operating Expenses	89,009,546.85	102,903,441.16	13,893,894.31
Net Revenue from Railway Operations	$ 31,178,142.29	$ 36,904,473.39	$ 5,726,331.10
Railway Taxes and Uncollectible Railway Revenue	$ 5,462,654.41	$ 6,288,874.33	$ 826,219.92
Railway Operating Income	$ 25,715,487.88	$ 30,615,599.06	$ 4,900,111.18
Other Operating Income	2,167,382.36	1,977,217.35	x 190,165.01
Total Operating Income	$ 27,882,870.24	$ 32,592,816.41	$ 4,709,946.17
Deductions from Operating Income	7,092,834.27	8,038,630.92	945,796.65
Net Railway Operating Income	$ 20,790,035.97	$ 24,554,185.49	$ 3,764,149.52
Non-Operating Income	4,952,458.58	5,447,204.84	494,746.26
Gross Income	$ 25,742,494.55	$ 30,001,390.33	$ 4,258,895.78
Deductions from Gross Income	19,028,883.76	17,783,626.96	x 1,245,256.80
Net Income transferred to Profit and Loss	$ 6,713,610.79	$ 12,217,763.37	$ 5,504,152.58

x Increase
* Includes back Mail Pay of $1,303,207.52.

Dividends

Regular quarterly dividends of 1¼% each, aggregating 5%, or $3,545,545.52 were declared on the PREFERRED STOCK during the year.

Income

A brief comparative statement of the Corporate Income is shown above, subdivided to indicate the "Net Railway Operating Income" defined in the Transportation Act of 1920.

Operations (Compared with Previous Year)

The results from operations for the year show decreases in volume of freight traffic handled, and in gross and net income, attributable to the general depression in business.

Total Railway Operating Revenues for the year were $120,187,689.14, as compared with $139,807,914.55 in the previous year, a decrease of $19,620,225.41, or 14.03%.

The decrease in Freight Revenue was $14,565,794.06, or 12.74%. There were decreases in all groups of commodities, the principal decreases being Products of Forests, $3,276,184.23, and Manufactures and Miscellaneous, $7,012,585.50. The decrease in revenue from Logs, included in Products of Forests, was $677,494.46, Lumber, Shingles, and Lath, $2,442,083.81, and Box, Crate and Cooperage Materials, $327,589.45. The principal decreases in Manufactures and Miscellaneous were Fuel, Road, and Petroleum Residual Oils, $476,363.20, Iron and Steel Pipe and Fittings, $668,656.48, Iron and Steel, $267,081.79, Machinery and Boilers, $252,481.56, Automobiles (Passenger), $2,157,068.74, Automobiles and Auto-trucks (Knocked down) and Parts, $374,304.52, and Manufactures and Miscellaneous, $1,472,037.61.

The Total Number of Tons of Revenue Freight Handled decreased 8.26%, and the Ton Miles decreased 6.22%. The Average Revenue Per Ton Mile was 9.63 mills, as compared with 10.35 mills in the previous year.

The Passenger Revenue for the Current Year was $10,210,815.19, as compared with $13,023,292.99, a decrease of 21.60%. Passengers Carried shows a decrease of 27.70%, and the

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Passengers Carried One Mile, a decrease of 20.90%. The increase in Average Distance Each Passenger Carried was 9.88 miles, or 9.40%, and the Average Revenue Per Passenger Per Mile was $0.0309, compared with $0.0312 last year.

The Mail Revenue for the Current Year was $3,374,115.11, as compared with $4,492,168.93 in 1929, which included a payment of $1,303,207.52 covering Back Railway Mail Pay.

Total Railway Operating Expenses decreased $13,893,894.31, or 13.50%.

Expenditures for Maintenance of Way decreased $6,368,064.05, Maintenance of Equipment Expenditures decreased $2,206,575.57, and Transportation Expenses decreased $4,343,268.98.

Hire of Freight Car Charges show a decrease of $932,330.25 over the previous year, due principally to a decrease in per diem payments of $1,447,864.46, and to an increase in the use of private car lines of $562,975.94, due to the increase in volume of traffic handled in private line cars. The average miles per car per day for 1930 was 42.73, compared with 41.91 in 1929, 40.63 in 1928, 38.80 in 1927, 39.66 in 1926, 37.22 in 1925, 33.02 in 1924, and 26.61 in 1923.

Federal Valuation

The Interstate Commerce Commission has not rendered its decision as to final value as of June 30th, 1918, following the formal hearing on protest to the tentative valuation concluded April 3rd, 1928.

Attention has been directed during the year to the work of bringing valuations to date of December 31st, 1927, in compliance with formal orders of the Commission, directing that reports be filed within ninety days subsequently to March 1st, 1929.

Reports have been completed and filed for all subsidiary companies and extensions of time for filing report for the principal Company have been granted. Substantial progress has been made on this report and it should be completed and filed in the early part of next year.

Your Company has petitioned the Interstate Commerce Commission to reopen and reconsider the final valuation of its property as of June 30th, 1918, giving consideration to a study made by your Company showing the total cash expended and securities issued for constructing the properties. The Commission had not acted upon the petition at the close of the year.

Pension System

One hundred sixty-eight employees were retired in 1930, and seventy pensioned employees died during the year. Since the inauguration of the Pension System, July 1, 1917, one thousand three hundred seventy-five employees have been retired, and four pensioners have returned to service. The total number of deaths, four hundred seventy-two. At the close of the year, eight hundred ninety-nine employees were receiving pensions averaging $57.45 per month, involving a monthly expenditure of $51,647.43.

Capital Stock

No changes have been made in the Capital Stock during the year.

The application made to the Interstate Commerce Commission, October 22, 1929, for authority to issue $38,659,900 common stock, at par, in settlement of the unpaid accumulated dividends on the preferred stock, has been withdrawn without prejudice to its renewal or to the filing of some modified or different plan for the payment of such dividends, when in the judgment of your Board of Directors, such action may become feasible or desirable.

Funded Debt

Long Term Debt outstanding in the hands of the public increased $22,121,600, the detail of changes being shown on page 13.

First and Refunding Mortgage 5% Bonds, Series H, to the amount of $25,000,000, were issued during the year, and sold.

Pacific Railroad of Missouri, Real Estate Security Mortgage Bond, in the amount of $1,000 was purchased during the year and placed in the treasury.

Equipment Trust Obligations, amounting to $2,877,400, matured and were paid during the year.

On February 16th, 1931, authority was granted by the Interstate Commerce Commission to issue and sell $61,200,000 principal amount, Missouri Pacific R. R. Co. First and Refunding Mortgage 5% Gold Bonds, Series I, due February 1, 1981, for the purpose of retiring outstanding General Consolidated Railway and Land Grant Mortgage 5% Bonds, to the amount of $42,874,000, maturing April 1, 1931, to reimburse the Company for Capital expenditures heretofore made, in the amount of $15,469,000, and to replace a like amount of Series G Bonds, held in the Treasury, to the amount of $2,857,000.

New Lines

No new lines were constructed during the year. Trackage agreement was entered into with the Denver and Rio Grande Western Railroad Company for the use of 1.13 miles of track into Union Passenger Station at Pueblo, Colorado. Other changes were of only minor importance, resulting in a net decrease in mileage owned and operated of 1.51 miles.

Lease of Subsidiary Companies

On June 2, 1930, the Interstate Commerce Commission conditionally approved the application made under Finance Docket 7470, to acquire control of various subsidiary companies by lease.

On October 24, 1930, the Commission allowed a rehearing and oral argument. No decision has been handed down.

Missouri Pacific Transportation Company

Additional franchises were purchased and leased during the year, aggregating 458 miles, while operations were permanently abandoned, on 346 miles of highway, making approximately 3,638 miles being served by motor coaches of the company in regular daily passenger service.

Under contractual arrangements with the Missouri Pacific Railroad and the Gulf Coast Lines, for the use of required facilities, a system of pick up and delivery service of less carload freight was inaugurated during the year in certain sections of the states of Arkansas and Texas.

Road and Equipment

A program was inaugurated in 1925 to improve the line between St. Louis and Jefferson City by double tracking, reducing grades and curves, and revising alignment. Except for three short sections totalling 3.76 miles, this work was completed during the past year by construction of 10.44 miles of second main track between Lake Hill and Eureka. Grades on this line have been reduced to maximum 0.3% in both directions, except for two short 0.5% velocity grades against westward trains. On the river route of the Eastern Division, 3.0 miles of second main track were constructed through Lamine, Mo., and 3.80 miles through Myrick, Mo. On the Central Kansas Division, improvement of grade and alignment was carried out between Osawatomie and Council Grove, 24.53 miles, and between Gypsum City and Hoisington, 14.24 miles. On the Arkansas Division, 9.81 miles of second main track were constructed southward from Newport across the White River Valley, at an elevation well above the highest known floods. During the past year 407.03 miles of automatic block signals were installed, making a total of 1,948.03 miles for the system, in addition to which 10 interlocking plants were installed and 24 highway crossings were equipped with signal protection. All equipment ordered in 1929 was delivered and put into service during the year.

The summary of charges to Road and Equipment follows:

New Lines Constructed, Completion of Prior Years' Projects		$ 193,167.28
Second Main Track		3,550,326.04
Road	$14,362,824.59	
Less Retirements	455,087.26	13,907,737.33
Equipment	$11,285,179.78	
Less Retirements	1,737,692.25	9,547,487.53
Assets and Liabilities not Appraised, June 1, 1917	Cr.	175,307.29
Total Charges to Road and Equipment		$27,023,410.89

By Order of the Board of Directors,
L. W. BALDWIN,
President.

Profit and Loss, December 31, 1930

Credit Balance, December 31, 1929		$58,919,997.75
Credit Balance Transferred from Income Account		6,713,610.79
Profit on Road Sold		643.95
Unrefundable Overcharges		5,314.75
Donations		104,740.97
Miscellaneous Credits		31,202.44
		$65,775,510.65
Less:		
Dividend Appropriations of Surplus	$3,545,545.52	
Surplus Appropriated for Investment in Physical Property	104,740.97	
Debt Discount Extinguished through Surplus	613,911.89	
Loss on Retired Road	412,988.59	
Miscellaneous Debits	143,044.29	4,820,231.26
Credit Balance, December 31, 1930		$60,955,279.39

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